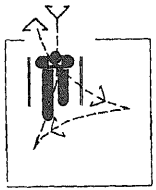


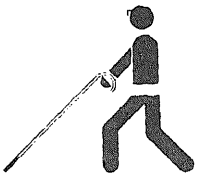
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Volum









ACCESS TO THE ENVIRONMENT

A Series of Reference Documents on the Design and Development of Site Facilities to Make Them Barrier Free to the Physically Handicapped and Disabled

Volume 3

Appendices
Domestic and International Examples of Legislation, Guidelines, Standards and Criteria, Bibliography, Listing of People and Organizations Contacted, Locations of Barrier Free Sites and Glossary of Terms

prepared by the

American Society of Landscape Architects Foundation

under contract (H-2002-R) with

the

Office of Policy Development and Research
Department of Housing and Urban Development

and the

Architectural and Transportation Barriers
Compliance Board

-2002-R

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This is a part of the summary publication of the research and development contract (H-2002-R) between the American Society of Landscape Architects Foundation and the Office of Community Design Research, Office of Policy Development and Research, Department of Housing and Urban Development. This publication is supplemented, in fulfillment of the contract obligations, by an 80-page document excerpting the major findings of this study and entitled "A Guide to Barrier-Free Site Design" and by two other volumes of the series of reference docu-

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Introduction

Appendix A: Examples of Legislation Guidelines, Standards, and Criteria

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INTRODUCTION TO VOLUME 3

APPENDICES

EXAMPLES OF TYPICAL LEGISLATION, STANDARDS, GUIDELINES, AND CRITERIA

The average environmental design office is ultimately responsible for the actual planning, design and specification of most site design projects. These offices seldom have on file all of the pertinent laws, guidelines, standards, criteria and regulations concerning barrier free site design.

The following collection is a cross-section of representative examples of some of the most important laws, guidelines, criteria, regulations, and standards or documents developed by either Federal agencies, by states, cities or local building authorities in both the United States and in various foreign countries.

They are reproduced in this publication as they pertain to site development in order to ease the burden of data gathering for other designers, administrators or others with an interest in the subject. Some of the documents reproduced are not easily or readily available in any other way since in some cases they are out of print or in other cases because they are published and distributed only in foreign countries.

NTRODUCTION TO THE SERIES

onvenient access to the outdoor environment is fre-
uently denied to many people in our society be-
ause of the manner in which outdoor elements are
esigned and constructed. Every person can expect
o be physically handicapped either temporarily or
ermanently at some time during their lifetime. A
other pushing a baby carriage, a shopper whose
rms are loaded down with packages, a child pull-
g a wagon, and a pregnant woman may find them-
lves unable to cope with a flight of stairs, a curb,
r a door because of the design of these objects.

hese people may expect to be relieved of their
andicaps within a fairly short length of time; unfor-
nately, there are also those who, through a perma-
ent handicap, will always be inhibited in their move-
ents.

he total number of permanently disabled people is
owing dramatically. The primary reasons for this
e better medical treatment and care, and as a di-
ct result of this, increased longevity. With people
ving well into their seventies, eighties, and nine-
es, it may be expected that the opportunity for a
aumatic injury or a debilitating disease during their
fetime is greatly increased. Also, the wars that have
ccurred in our recent history have created large
umbers of disabled people.

the past, the basic attitude of the general popula-
on toward those with various disabilities was, "Out
sight - out of mind." Current attitudes place more
mphasis upon encouraging disabled people to lead
ore productive lives and to avail themselves of edu-
ational opportunities. Concomitant with this, a na-
onal effort is being made to employ the handi-
apped. This, of course, requires that those with
sabilities must be able to go easily to a place of
ducation or employment. However, while barrier-
ee architecture, at least in public buildings, is be-
oming a reality through federal, state, and local
odes and legislation, provisions to assure barrier-
ee site design have for the most part been ne-
ected. This inadequacy has not been as intention-
as it has been accidental. Standards, details and
ther design configurations which have limited the

on state and local levels, independent institution
and a number of design firms, the work is so sc
tered as to be of little use. There has been a need
the development of a centralized reference for t
sharing of basic resource material for the design
site facilities.

This publication is a compendium of the materi
and information gathered under that contract.
briefer document, Barrier Free Site Design, availa
through the Superintendent of Documents, U
Government Printing Office, has been prepared a
summary of the study, for easy reference.

The purpose of this publication is to provide
landscape architects and the designers a compli
manual showing how to design a barrier free envir
ment, and to provide administrators sufficient ba
ground material to judge wisely the constructi
requirements for outdoor design.

This document contains information on how s
elements such as walks, seats, steps, railings, plant
drinking fountains, lighting fixtures, play equipme
waste receptacles, signage and other outdoor des
elements may be and have been designed and loca
so as to make them usable by the handicapped.
is also concerned with the combination and integ
tion of these individual components with all t
elements of site to form a totally accessible envir
ment for all.

It offers guidelines, criteria, details, planning cons
erations, relationships, studies and coverage of t
interrelationships between site elements, architect
and transportation facilities and systems. It does
deal with any of the interior aspects of the buildi
themselves nor with the inside of vehicles or t
actual transportation facilities themselves.

Purpose of Study

The purpose of these publications is to provide in one source, for both administrators and designers, the necessary information that can lead to designs that consider all persons using the outdoor environment. These are not intended to present rigid guidelines or standards, but rather that they should act as a means of sharing information and experience. This is an assembling of much of the research data and material gathered in the course of this study.

This document is meant to be used as a tool for design and evaluation and for promoting and assisting further research by administrators, landscape architects, architects, engineers, handicapped people with an interest in accessible exterior facilities, maintenance personnel, other concerned groups, research organizations, students, and all people interested in a totally barrier free environment.

It is hoped that it will assist anyone who may be inadvertently preventing handicapped people from enjoying total access to the environment because of a lack of knowledge of pertinent guidelines or details.

Content of Study

The information presented within these publications relates to the following areas:

1. The status of federal and local legislation, standards, guidelines and criteria, both past and present, in making the exterior environment more accessible. A profile of current legislation and requirements enacted by individual states is provided in Volume 3.

2. The relationships of the costs in providing barrier-free access for both existing and proposed construction.

3. Details of how site elements such as steps and ramps, seating, handrails, parking stalls, waste receptacles and site lighting may be designed so as to be usable by the handicapped. Guidelines, planning considerations, and coverage of the interrelationships between site elements, architecture, and transportation systems are included. The document does not deal with the interior aspects of buildings nor with the actual systems of transportation since much has already been published and distributed on this area of interest. Neither does it deal with handicaps of such severity that the individual is completely unable to use the outdoor environment without a great deal of

that have been helpful during the study
the end of this publication.

Study Methodology

The methodology for this study inclu
lection of information concerning the li
persons with various handicaps, the stud
constraints manifested by various disabil
gathering of details and planning studies
been related to making the exterior
more accessible to the disabled. Aft
standards, guidelines, details and site
gathered, they were compiled, organize
were then supplemented by papers an
prepared by various designers, recreation
and other specialists who served as consu
study. The material has been assessed, a
altered where necessary by representati
organizations, governmental agencies, ar
presenting handicapped populations in
view seminars conducted as part of

In addition to the information presente
blication, a digested report was develope
this same study and is entitled "Barrier F
sign." It is available through the Superi
Documents, U.S. Government Printing
shington, D.C. (Stock No. 023-000-0029

Definition of Terms

For the purpose of this study it has been
define particular handicaps, impairment
trictive devices so that they may be rela
vidual design elements. The terminolog
low, with the exception of "tempora
ments," is generally accepted and used i
dealing with handicapped.

1. Temporary Impairments

Temporary impairment refers to any an
tions in which people become temporaril
in their movements either through a
trauma that requires time to heal, or sim
forming the normal functions of everyda
pregnant woman, the shopper with his ar
with packages, the skier with a broken le
woman wearing high heel shoes are all "ha
to a degree" in their movements, but the
their impairment is relatively short-lived.

2. Activity Impairments

not included. In general, people with activity impairments cannot play strenuous games or engage in unlimited physical activity.

3. Mobility Impairments

It may be caused by such things as partial paralysis which has not been compensated for by the use of ambulatory aids, or the absence of extremities which have not been replaced by mechanical aids. Disabilities, deformities, or handicaps which curtail the movement of the person are included in this category.

The research and development of this publication was made possible by a contract (H-2002-R) between the Office of Policy Development and Research of the Department of Housing and Urban Development and The American Society of Landscape Architects Foundation. The following organizations and individuals have contributed directly to the production of this publication:

1. The Architectural and Transportation Barriers Compliance Board (A&TBCB): Washington, D.C. The overall guidance and direction provided by members of the staff of the A&TBCB was essential in preparing the format and much of the content of these final documents. Their unique viewpoint and perspective resulted in a study and a series of publications which were much more pertinent, succinct and more accurate and orderly than would have been the case without their guidance and assistance.

2. U.S. Department of Housing and Urban Development: Washington, D.C. Special acknowledgment and appreciation must be expressed to staff members from the offices of Community Design Research, Equal Opportunity and Special User Needs Research/Policy Development and Research, Special Concerns/Housing Management, and Office of Programs for the Elderly and the Handicapped, for their insight, perception, and guidance, as well as their valuable input and review data submitted

ıe course of the research and
)hase of this project.

y of Landscape Architects Foun-
, Virginia. Mr. Gary O. Robinette,
tor. As project director, Mr.
esponsible for coordination be-
parties involved in the production
ın and was responsible for much
ıent as well. Research Associates
Foundation were Mr. Jay Jorgen-
)resentative on the Architectural
tee of the President's Committee
of the Handicapped, and Profes-
v, Director of the Department of
tecture at Virginia Polytechnic In-
University. These gentlemen pro-
ata from which the design recom-
ıuidelines were established.

e - Landscape Architects, Avon

to the panels of reviewers for their comments
its completeness, its accuracy and appropriatenes
These panels consisted of designers, administr
tors, persons with specific handicaps, educator
and members of both public and private groups
ganized to represent handicapped persons natio
wide.

Review panels have included representatives
from the Federal Government Offices listed
below and the following people:

U.S. Department of Housing and Urban Develo
Community Planning and Development
Housing Production and Mortgage Credit
Policy Development and Research

U.S. Department of Health, Education and Wel
Bureau of Education of the Handicapped
Rehabilitation Services Administration
Office of Facility Engineering Property
Management
Social Security Administration

U.S. Department of Transportation
Urban Mass Transportation Administration
Office of Service and Methods Demonstratio

U.S. Department of Agriculture
Forest Service

Richard Austin, Kansas State University

Richard Blakeley, University of Wisconsin, De
partment of Landscape Architecture

Paul Carr, The Community Group Corporatio

James Gashel, National Federation of the Blinc

William A. Hillman, Jr., Bureau of Education fo
the Handicapped, Division of Training Programs

Jerry Hitzhozen, National Recreation and Park
Association

Dean Johnson, Johnson and Dee, Landscape Ar-
chitects

William Kirwin, Smith/Kirwin

Marcia Lacy, Psychiatric Institute of America

ciation

Julian Stein, American Association for Health, Physical Education and Recreation

Frederick C. Terzo, The Rouse Company

Thomas B. Thompson, Architectural Consultant

Robert Van Beck, National Easter Seal Society for Crippled Children and Adults

Doris Wright, The Community Group Corporation

Robert Zolomij, University of Illinois

Special thanks must especially be expressed to all of the organizations, agencies, individuals, and offices which so generously provided research data and material. These are, unfortunately, too numerous to mention individually.

constructed as to be accessible to the physically handicapped.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That, as used in this Act, the term "building" means any building or facility (other than (A) a privately owned residential structure and (B) any building or facility on a military installation designed and constructed primarily for use by able bodied military personnel) the intended use for which either will require that such building or facility be accessible to the public, or may result in the employment or residence therein of physically handicapped persons, which building or facility is— Public buildings. Accessibility to physically handicapped.

82 STAT. 718

82 STAT. 719

(1) to be constructed or altered by or on behalf of the United States;

(2) to be leased in whole or in part by the United States after the date of enactment of this Act after construction or alteration in accordance with plans and specifications of the United States; or

(3) to be financed in whole or in part by a grant or a loan made by the United States after the date of enactment of this Act if such building or facility is subject to standards for design, construction, or alteration issued under authority of the law authorizing such grant or loan.

SEC. 2. The Administrator of General Services, in consultation with the Secretary of Health, Education, and Welfare, is authorized to prescribe such standards for the design, construction, and alteration of buildings (other than residential structures subject to this Act and buildings, structures, and facilities of the Department of Defense subject to this Act) as may be necessary to insure that physically handicapped persons will have ready access to, and use of, such buildings. Standards.

SEC. 3. The Secretary of Housing and Urban Development, in consultation with the Secretary of Health, Education, and Welfare, is authorized to prescribe such standards for the design, construction, and alteration of buildings which are residential structures subject to this Act as may be necessary to insure that physically handicapped persons will have ready access to, and use of, such buildings.

SEC. 4. The Secretary of Defense, in consultation with the Secretary of Health, Education, and Welfare, is authorized to prescribe such standards for the design, construction, and alteration of buildings, structures, and facilities of the Department of Defense subject to this Act as may be necessary to insure that physically handicapped persons will have ready access to, and use of, such buildings.

SEC. 5. Every building designed, constructed, or altered after the effective date of a standard issued under this Act which is applicable to such building, shall be designed, constructed, or altered in accordance with such standard. Applicability.

SEC. 6. The Administrator of General Services, with respect to standards issued under section 2 of this Act, and the Secretary of Housing and Urban Development, with respect to standards issued under section 3 of this Act, and the Secretary of Defense with respect to standards issued under section 4 of this Act, is authorized—

(1) to modify or waive any such standard, on a case-by-case basis, upon application made by the head of the department, agency, or instrumentality of the United States concerned, and upon a determination by the Administrator or Secretary, as the case may be, that such modification or waiver is clearly necessary, and Waiver.

(2) to conduct such surveys and investigations as he deems necessary to insure compliance with such standards. Surveys and investigations.

Approved August 12, 1968.

HOUSE REPORTS: No. 1532 accompanying H. R. 6589 (Comm. on Public Works) and No. 1787 (Comm. of Conference).
SENATE REPORT No. 538 (Comm. on Public Works).

Public Law 91-205
91st Congress, H. R. 14464
March 5, 1970

An Act

To amend the Act of August 12, 1968, to insure that certain facilities constructed under authority of Federal law are designed and constructed to be accessible to the physically handicapped.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the first section of the Act entitled "An Act to insure that certain buildings financed with Federal funds are so designed and constructed as to be accessible to the physically handicapped", approved August 12, 1968 (42 U.S.C. 4151), is amended—

Public buildings. Accessibility to physically handicapped.

82 Stat. 718.

(1) by striking out "or" at the end of paragraph (2);

(2) by striking out the period at the end of paragraph (3) and inserting in lieu thereof: "; or"; and

(3) by adding at the end thereof the following:

"(4) to be constructed under authority of the National Capital Transportation Act of 1960, the National Capital Transportation Act of 1965, or title III of the Washington Metropolitan Area Transit Regulation Compact."

83 Stat. 322.
79 Stat. 663.
40 USC 681 note.
80 Stat. 1324.
D.C. Code 1-1431 note.

Approved March 5, 1970.

LEGISLATIVE HISTORY:

HOUSE REPORT No. 91-750 (Comm. on Public Works).
SENATE REPORT: No. 91-658 (Comm. on Public Works).
CONGRESSIONAL RECORD:
Vol. 115 (1969): Dec. 15, considered and passed House.
Vol. 116 (1970): Feb. 10, considered and passed Senate, amended.
Feb. 19, House concurred in Senate amendments.

Establishment; membership.

SEC. 502. (a) There is established within the Federal Government the Architectural and Transportation Barriers Compliance Board (hereinafter referred to as the "Board") which shall be composed of the heads of each of the following departments or agencies (or their designees whose positions are Executive Level IV or higher):

83 Stat. 864.
5 USC 5315 note.

(1) Department of Health, Education, and Welfare;
(2) Department of Transportation;
(3) Department of Housing and Urban Development;
(4) Department of Labor;
(5) Department of the Interior;
(6) General Services Administration;
(7) United States Postal Service; and
(8) Veterans' Administration.

(b) It shall be the function of the Board to: (1) insure compliance with the standards prescribed by the General Services Administration, the Department of Defense, and the Department of Housing and Urban Development pursuant to the Architectural Barriers Act of 1968 (Public Law 90–480), as amended by the Act of March 5, 1970 (Public Law 91–205); (2) investigate and examine alternative approaches to the architectural, transportation, and attitudinal barriers confronting handicapped individuals, particularly with respect to public buildings and monuments, parks and parklands, public transportation (including air, water, and surface transportation whether interstate, foreign, intrastate, or local), and residential and institutional housing; (3) determine what measures are being taken by Federal, State, and local governments and by other public or nonprofit agencies to eliminate the barriers described in clause (2) of this subsection; (4) promote the use of the International Accessibility Symbol in all public facilities that are in compliance with the standards prescribed by the Administrator of the General Services Administration, the Secretary of Defense, and the Secretary of Housing and Urban Development pursuant to the Architectural Barriers Act of 1968; (5) make to the President and to Congress reports which shall describe in detail the results to its investigations under clauses (2) and (3) of this subsection; and (6) make to the President and to the Congress such recommendations for legislation and administration as it deems necessary or desirable to eliminate the barriers described in clause (2) of this subsection.

82 Stat. 718; 84 Stat. 49. 42 USC 4151.

International Accessibility Symbol, promotion.

Reports to President and Congress.

Transportation barriers.

(c) The Board shall also (1) (A) determine how and to what extent transportation barriers impede the mobility of handicapped individuals and aged handicapped individuals and consider ways in which travel expenses in connection with transportation to and from work for handicapped individuals can be met or subsidized when such individuals are unable to use mass transit systems or need special equipment in private transportation, and (B) consider the housing needs of handicapped individuals; (2) determine what measures are being taken, especially by public and other nonprofit agencies and groups having an interest in and a capacity to deal with such problems, (A) to eliminate barriers from public transportation systems (including vehicles used in such systems), and to prevent their incorporation in new or expanded transportation systems and (B) to make housing available and accessible to handicapped individuals or to meet sheltered housing needs; and (3) prepare plans and proposals for such further actions as may be necessary to the goals of adequate transportation and housing for handicapped individuals, including proposals for bringing together in a cooperative effort, agencies, organizations, and groups already working toward such goals or whose cooperation is essential to effective and comprehensive action.

(d) In carrying out its functions under this section, the Board shall conduct investigations, hold public hearings, and issue such orders as

it deems necessary to insure compliance with the provisions of the Acts cited in subsection (b). The provisions of subchapter II of chapter 5, and chapter 7 of title 5, United States Code, shall apply to procedures under this section, and an order of compliance issued by the Board shall be a final order for purposes of judicial review. 5 USC 551, 701.

(e) The Board is authorized to appoint as many hearing examiners as are necessary for proceedings required to be conducted under this section. The provisions applicable to hearing examiners appointed under section 3105 of title 5, United States Code, shall apply to hearing examiners appointed under this subsection. 80 Stat. 415.

(f) The departments or agencies specified in subsection (a) of this section shall make available to the Board such technical, administrative, or other assistance as it may require to carry out its functions under this section, and the Board may appoint such other advisers, technical experts, and consultants as it deems necessary to assist it in carrying out its functions under this section. Special advisory and technical experts and consultants appointed pursuant to this subsection shall, while performing their functions under this section, be entitled to receive compensation at rates fixed by the Secretary, but not exceeding the daily pay rate, for a person employed as a GS-18 under section 5332 of title 45, United States Code, including traveltime, and while serving away from their homes or regular places of business they may be allowed travel expenses, including per diem in lieu of subsistence, as authorized by section 5703 of such title 5 for persons in the Government service employed intermittently. Technical assistance. 5 USC 5332 note. 80 Stat. 499; 83 Stat. 190.

(g) The Board shall, at the end of each fiscal year, report its activities during the preceding fiscal year to the Congress. Such report shall include an assessment of the extent of compliance with the Acts cited in subsection (b) of this section, along with a description and analysis of investigations made and actions taken by the Board, and the reports and recommendations described in clauses (5) and (6) of subsection (b) of this section. The Board shall prepare two final reports of its activities under subsection (c). One such report shall be on its activities in the field of transportation barriers to handicapped individuals, and the other such report shall be on its activities in the field of the housing needs of handicapped individuals. The Board shall, prior to January 1, 1975, submit each such report, together with its recommendations, to the President and the Congress. The Board shall also prepare for such submission an interim report of its activities in each such field within 18 months after the date of enactment of this Act. Report to Congress. Report to the President and Congress.

(h) There are authorized to be appropriated for the purpose of carrying out the duties and functions of the Board under this section $1,000,000 each for the fiscal years ending June 30, 1974, and June 30, 1975. Appropriation.

American National Standards

The standard in this booklet is one of nearly 4,000 standards approved to date by the American National Standards Institute, formerly the USA Standards Institute.

The Standards Institute provides the machinery for creating voluntary standards. It serves to eliminate duplication of standards activities and to weld conflicting standards into single, nationally accepted standards under the designation "American National Standards."

Each standard represents general agreement among maker, seller, and user groups as to the best current practice with regard to some specific problem. Thus the completed standards cut across the whole fabric of production, distribution, and consumption of goods and services. American National Standards, by reason of Institute procedures, reflect a national consensus of manufacturers, consumers, and scientific, technical, and professional organizations, and governmental agencies. The completed standards are used widely by industry and commerce and often by municipal, state, and federal governments.

The Standards Institute, under whose auspices this work is being done, is the United States clearinghouse and coordinating body for standards activity on the national level. It is a federation of trade associations, technical societies, professional groups, and consumer organizations. Some 1,000 companies are affiliated with the Institute as company members.

The American National Standards Institute is the United States member of the International Organization for Standardization (ISO), the International Electrotechnical Commission (IEC), and the Pan American Standards Commission (COPANT). Through these channels American industry makes its position felt on the international level. American National Standards are on file in the libraries of the national standards bodies of more than 50 countries.

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American Standard Specifications for

Making Buildings and Facilities Accessible to, and Usable by, the Physically Handicapped

Sponsors

National Society for Crippled Children and Adults

The President's Committee on Employment of the Physically Handicapped

(This Foreword is not a part of American Standard Specifications for Making Buildings and Facilities Accessible to, and Us by, the Physically Handicapped, A117.1-1961.)

Approximately one out of seven people in our nation has a permanent physical disability. This segmen our population represents human resources of inestimable value and is of great economic significance to entire nation.

The most common design and construction of buildings and facilities cause problems for the physic handicapped that lessen the social and economic gains now evident in the rehabilitation of these individu These architectural barriers make it very difficult to project the physically handicapped into normal situati of education, recreation, and employment.

In May, 1959, the ASA, acting on the request of The President's Committee on Employment of Physically Handicapped, called a general conference of those groups vitally interested in the problem. T conference recommended the initiation of a project, and this recommendation was subsequently approved the Construction Standards Board. The President's Committee on Employment of the Physically Har capped and the National Society for Crippled Children and Adults were designated as co-sponsors, and latter agreed to assume the secretariat.

This standard supplements other American Standards relating to various aspects of buildings and faciliti Its specifications, which are the result of extended and careful consideration of available knowledge and expe ence on this subject, are intended to present minimum requirements. They are recommended for use in construction of all buildings and facilities and for adoption and enforcement by administrative authorities, that those individuals with permanent physical disabilities might pursue their interests and aspirations, devel their talents, and exercise their skills.

The ASA Sectional Committee on Facilities in Public Buildings for Persons with Physical Handicaps, A1 which developed this standard, had the following personnel at the time of approval.

LEON CHATELAIN, JR, *Chairman* — T. J. NUGENT, *Secretary*

Organization Represented	*Name of Representative*
AFL-CIO	WALTER MASON
American Foundation for the Blind	ARTHUR VOORHEES
American Hospital Association	MARGARET E. PETERS
American Hotel Association	JAKE FASSETT
American Institute of Architects	CLINTON H. COWGILL
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American Physical Therapy Association	LUCY BLAIR
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Standard Specifications for
Making Buildings and Facilities Accessible to, and Usable by, the Physically Handicapped

1. Scope and Purpose

1.1 Scope

1.1.1 This standard applies to all buildings and facilities used by the public. It applies to temporary or emergency conditions as well as permanent conditions. It does not apply to private residences.

1.1.2 This standard is concerned with non-ambulatory disabilities, semi-ambulatory disabilities, sight disabilities, hearing disabilities, disabilities of incoordination, and aging.[1]

1.2 Purpose. This standard is intended to make all buildings and facilities used by the public accessible to, and functional for, the physically handicapped, to, through, and within their doors, without loss of function, space, or facility where the general public is concerned. It supplements existing American Standards, and reflects great concern for safety of life and limb. In cases of practical difficulty, unnecessary hardship, or extreme differences, administrative authorities may grant exceptions from the literal requirements of this standard or permit the use of other methods or materials, but only when it is clearly evident that equivalent facilitation and protection are thereby secured.

2. Definitions

2.1 Non-ambulatory Disabilities. Impairments that, regardless of cause or manifestation, for all practical purposes, confine individuals to wheelchairs.

2.2 Semi-ambulatory Disabilities. Impairments that cause individuals to walk with difficulty or insecurity. Individuals using braces or crutches, amputees, arthritics, spastics, and those with pulmonary and cardiac ills may be semi-ambulatory.

2.3 Sight Disabilities. Total blindness or impairments affecting sight to the extent that the individual functioning in public areas is insecure or exposed to danger.

2.4 Hearing Disabilities. Deafness or hearing handicaps that might make an individual insecure in public areas because he is unable to communicate or hear warning signals.

2.5 Disabilities of Incoordination. Faulty coordination or palsy from brain, spinal, or peripheral nerve injury.

2.6 Aging. Those manifestations of the aging processes that significantly reduce mobility, flexibility, coordination, and perceptiveness but are not accounted for in the aforementioned categories.

2.7 Standard. When this term appears in small letters and is not preceded by the word "American," it is descriptive and does not refer to an American Standard approved by ASA; for example, a "standard" wheelchair is one characterized as standard by the manufacturers.

2.8 Fixed Turning Radius, Wheel to Wheel. The tracking of the caster wheels and large wheels of a wheelchair when pivoting on a spot.

2.9 Fixed Turning Radius, Front Structure to Rear Structure. The turning radius of a wheelchair, left front-foot platform to right rear wheel, or right front-foot platform to left rear wheel, when pivoting on a spot.

2.10 Involved (Involvement). A portion or portions of the human anatomy or physiology, or both, that have a loss or impairment of normal function as a result of genesis, trauma, disease, inflammation, or degeneration.

2.11 Ramps, Ramps with Gradients. Because the term "ramp" has a multitude of meanings and uses, its use in this text is clearly defined as ramps with gradients (or ramps with slopes) that deviate from what would otherwise be considered the normal level. An exterior ramp, as distinguished from a "walk," would be considered an appendage to a building leading to a level above or below existing ground level. As such, a ramp shall meet certain requirements similar to those imposed upon stairs.

2.12 Walk, Walks. Because the terms "walk" and "walks" have a multitude of meanings and uses, their use in this text is clearly defined as a predetermined, prepared-surface, exterior pathway leading to

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2.12 Walk, Walks. Because the terms "walk"

and not deviating from the level of the existing ground immediately adjacent.

2.13 Appropriate Number. As used in this text, appropriate number means the number of a specific item that would be necessary, in accord with the purpose and function of a building or facility, to accommodate individuals with specific disabilities in proportion to the anticipated number of individuals with disabilities who would use a particular building or facility.

EXAMPLE: Although these specifications shall apply to all buildings and facilities used by the public, the numerical need for a specific item would differ, for example, between a major transportation terminal, where many individuals with diverse disabilities would be continually coming and going, an office building or factory, where varying numbers of individuals with disabilities of varying manifestations (in many instances, very large numbers) might be employed or have reason for frequent visits, a school or church, where the number of individuals may be fixed and activities more definitive, and the many other buildings and facilities dedicated to specific functions and purposes.

NOTE: Disabilities are specific and where the individual has been properly evaluated and properly oriented and where architectural barriers have been eliminated, a specific disability does not constitute a handicap. It should be emphasized that more and more of those physically disabled are ing *participants*, rather than spectators, in the fullest 'g of the word.

Principles and lerations

3.1 Wheelchair Specifications. The collapsible-model wheelchair of tubular metal construction with plastic upholstery for back and seat is most commonly used. The standard model of all manufacturers falls within the following limits, which were used as the basis of consideration:

(1) Length: 42 inches

(2) Width, when open: 25 inches

(3) Height of seat from floor: 19½ inches

(4) Height of armrest from floor: 29 inches

(5) Height of pusher handles (rear) from floor: 36 inches

(6) Width, when collapsed: 11 inches

3.2 The Functioning of a Wheelchair

3.2.1 The fixed turning radius of a standard wheelchair, wheel to wheel, is 18 inches. The fixed turning radius, front structure to rear structure, is 31.5 inches.

wide, specifically, 63 x 56 inches, is more workable and desirable. In an area with two open ends, such as might be the case in a corridor, a minimum of 54 inches between two walls would permit a 360-degree turn.

3.2.3 A minimum width of 60 inches is required for two individuals in wheelchairs to pass each other.

3.3 The Adult Individual Functioning in a Wheelchair[2]

3.3.1 The average unilateral vertical reach is 60 inches and ranges from 54 inches to 73 inches.

3.3.2 The average horizontal working (table) reach is 30.8 inches and ranges from 28.5 inches to 33.2 inches.

3.3.3 The bilateral horizontal reach, both arms extended to each side, shoulder high, ranges from 54 inches to 71 inches and averages 64.5 inches.

3.3.4 An individual reaching diagonally, as would be required in using a wall-mounted dial telephone or towel dispenser, would make the average reach (on the wall) 48 inches from the floor.

3.4 The Individual Functioning on Crutches[3]

3.4.1 On the average, individuals 5 feet 6 inches tall require an average of 31 inches between crutch tips in the normally accepted gaits.[4]

3.4.2 On the average, individuals 6 feet 0 inches tall require an average of 32.5 inches between crutch tips in the normally accepted gaits.[4]

4. Site Development[5]

4.1 Grading. The grading of ground, even contrary to existing topography, so that it attains a level with a normal entrance will make a facility accessible to individuals with physical disabilities.

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[2] Extremely small, large, strong, or weak and involved individuals could fall outside the ranges in 3.3.1, 3.3.2, 3.3.3, and their reach could differ from the figure given in 3.3.4. However, these reaches were determined using a large number of individuals who were functionally trained, with a wide range in individual size and involvement.

[3] Most individuals ambulating on braces or crutches, or both, or on canes are able to manipulate within the specifications prescribed for wheelchairs, although doors present quite a problem at times. However, attention is called to the fact that a crutch tip extending laterally from an individual is not obvious to others in heavily trafficked areas, certainly not as obvious or protective as a wheelchair and is, therefore, a source of vulnerability.

[4] Some cerebral palsied individuals, and some severe arthritics, would be extreme exceptions to 3.4.1 and 3.4.2.

[5] Site development is the most effective means to resolve the problems created by topography, definitive architectural de-

4.2 Walks

4.2.1 Public walks should be at least 48 inches wide and should have a gradient not greater than 5 percent.[6]

4.2.2 Such walks shall be of a continuing common surface, not interrupted by steps or abrupt changes in level.

4.2.3 Wherever walks cross other walks, driveways, or parking lots they should blend to a common level.[7]

NOTE: 4.1 and 4.2, separately or collectively, are greatly aided by terracing, retaining walls, and winding walks allowing for more gradual incline, thereby making almost any building accessible to individuals with permanent physical disabilities, while contributing to its esthetic qualities.

4.2.4 A walk shall have a level platform at the top which is at least 5 feet by 5 feet, if a door swings out onto the platform or toward the walk. This platform shall extend at least 1 foot beyond each side of the doorway.

4.2.5 A walk shall have a level platform at least 3 feet deep and 5 feet wide, if the door does not swing onto the platform or toward the walk. This platform shall extend at least 1 foot beyond each side of the doorway.

4.3 Parking Lots

4.3.1 Spaces that are accessible and approximate to the facility should be set aside and identified for use by individuals with physical disabilities.

4.3.2 A parking space open on one side, allowing room for individuals in wheelchairs or individuals on braces and crutches to get in and out of an automobile onto a level surface, suitable for wheeling and walking, is adequate.

4.3.3 Parking spaces for individuals with physical disabilities when placed between two conventional diagonal or head-on parking spaces should be 12 feet wide.

4.3.4 Care in planning should be exercised so that individuals in wheelchairs and individuals using braces and crutches are not compelled to wheel or walk behind parked cars.

4.3.5 Consideration should be given the distribution of spaces for use by the disabled in accordance with the frequency and persistency of parking needs.

4.3.6 Walks shall be in conformity with 4.2.

5. Buildings

5.1 Ramps with Gradients. Where ramps with gradients are necessary or desired, they shall conform to the following specifications:

5.1.1 A ramp shall not have a slope greater than 1 foot rise in 12 feet, or 8.33 percent, or 4 degrees 50 minutes.

5.1.2 A ramp shall have handrails on at least one side, and preferably two sides, that are 32 inches in height, measured from the surface of the ramp, that are smooth, that extend 1 foot beyond the top and bottom of the ramp, and that otherwise conform with American Standard Safety Code for Floor and Wall Openings, Railings, and Toe Boards, A12.1-1932.

NOTE 1: Where codes specify handrails to be of heights other than 32 inches, it is recommended that two sets of handrails be installed to serve all people. Where major traffic is predominantly children, particularly physically disabled children, extra care should be exercised in the placement of handrails, in accordance with the nature of the facility and the age group or groups being serviced.

NOTE 2: Care should be taken that the extension of the handrail is not in itself a hazard. The extension may be made on the side of a continuing wall.

5.1.3 A ramp shall have a surface that is nonslip.

5.1.4 A ramp shall have a level platform at the top which is at least 5 feet by 5 feet, if a door swings out onto the platform or toward the ramp. This platform shall extend at least 1 foot beyond each side of the doorway.

5.1.5 A ramp shall have a level platform at least 3 feet deep and 5 feet wide, if the door does not swing onto the platform or toward the ramp. This platform shall extend at least 1 foot beyond each side of the doorway.

5.1.6 Each ramp shall have at least 6 feet of

[6] It is essential that the gradient of walks and driveways be less than that prescribed for ramps, since walks would be void of handrails and curbs and would be considerably longer and more vulnerable to the elements. Walks of near maximum grade and considerable length should have level areas at intervals for purposes of rest and safety. Walks or driveways should have a nonslip surface.

[7] This specification does not require the elimination of curbs, which, particularly if they occur at regular intersections, are a distinct safety feature for all of the handicapped, particularly the blind. The preferred method of meeting the specification is to have the walk incline to the level of the street. However, at principal intersections, it is vitally important that the curb run parallel to the street, up to the point

5.11 Identification. Appropriate identification of specific facilities within a building used by the public is particularly essential to the blind.

5.11.1 Raised letters or numbers shall be used to identify rooms or offices.

5.11.2 Such identification should be placed on the wall, to the right or left of the door, at a height between 4 feet 6 inches and 5 feet 6 inches, measured from the floor, and preferably at 5 feet.

5.11.3 Doors that are not intended for normal use, and that might prove dangerous if a blind person were to exit or enter by them, should be made quickly identifiable to the touch by knurling the door handle or knob. (See Fig. 2.)

EXAMPLE: Such doors might lead to loading platforms, boiler rooms, stages, fire escapes, etc.

Warning Signals

5.12.1 Audible warning signals shall be accompanied by simultaneous visual signals for the benefit of those with hearing disabilities.

5.12.2 Visual signals shall be accompanied by simultaneous audible signals for the benefit of the blind.

5.13 Hazards. Every effort shall be exercised to obviate hazards to individuals with physical disabilities.

5.13.1 Access panels or manholes in floors, walks, and walls can be extremely hazardous, particularly when in use, and should be avoided.

5.13.2 When manholes or access panels are open and in use, or when an open excavation exists on a site, particularly when it is approximate to normal pedestrian traffic, barricades shall be placed on all open sides, at least 8 feet from the hazard, and warning devices shall be installed in accord with 5.12.2.

5.13.3 Low-hanging door closers that remain within the opening of a doorway when the door is open, or that protrude hazardously into regular corridors or traffic ways when the door is closed, shall be avoided.

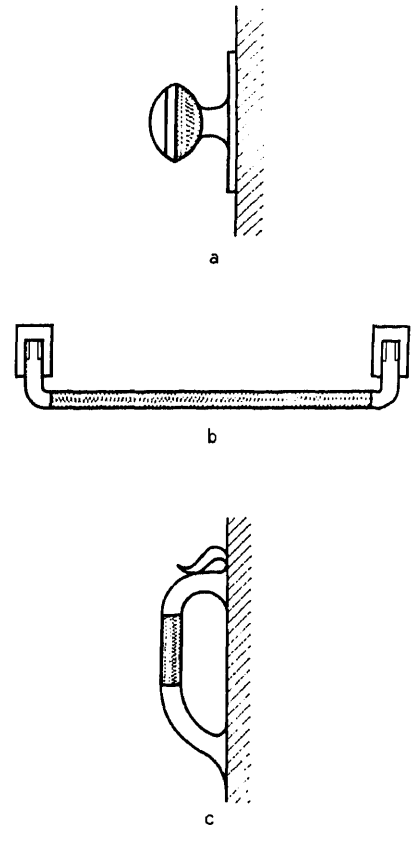


Fig. 2
Knurled Door Handles and Knobs

5.13.5 Lighting on ramps shall be in accord with

5.2 Entrances

5.2.1 At least one primary entrance to each building shall be usable by individuals in wheelchairs.

NOTE: Because entrances also serve as exits, some being particularly important in case of an emergency, and because the proximity of such exits to all parts of buildings and facilities, in accordance with their design and function, is essential (see 112 and 2000 through 2031 of American Standard Building Exits Code, A9.1-1953) it is preferable that all or most entrances (exits) should be accessible to, and usable by, individuals in wheelchairs and individuals with other forms of physical disability herein applicable.

5.2.2 At least one entrance usable by individuals in wheelchairs shall be on a level that would make the elevators accessible.

5.3 Doors and Doorways

5.3.1 Doors shall have a clear opening of no less than 32 inches when open and shall be operable by a single effort.

NOTE 1: Two-leaf doors are not usable by those with disabilities defined in 2.1, 2.2, and 2.5 unless they operate by a single effort, or unless one of the two leaves meets the requirement of 5.3.1.

NOTE 2: It is recommended that all doors have kick plates extending from the bottom of the door to at least 16 inches from the floor, or be made of a material and finish that would safely withstand the abuse they might receive from canes, crutches, wheelchair foot-platforms, or wheelchair wheels.

5.3.2 The floor on the inside and outside of each doorway shall be level for a distance of 5 feet from the door in the direction the door swings and shall extend 1 foot beyond each side of the door.

5.3.3 Sharp inclines and abrupt changes in level shall be avoided at doorsills. As much as possible, thresholds shall be flush with the floor.

NOTE 1: Care should be taken in the selection, placement, and setting of door closers so that they do not prevent the use of doors by the physically disabled. Time-delay door closers are recommended.

NOTE 2: Automatic doors that otherwise conform to 5.3.1, 5.3.2, and 5.3.3 are very satisfactory.

NOTE 3: These specifications apply both to exterior and interior doors and doorways.

5.4 Stairs. Stairs shall conform to American Standard A9.1-1953, with the following additional considerations:

5.4.1 Steps in stairs that might require use by those with disabilities defined in 2.2 and 2.5 or by the aged shall not have abrupt (square) nosing. (See Fig. 1.)

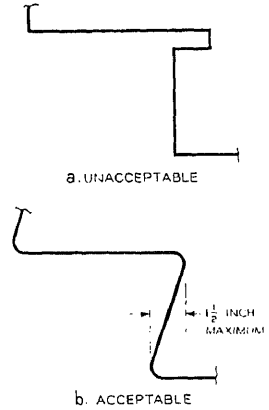


Fig. 1
Steps

5.4.2 Stairs shall have handrails 32 inches high as measured from the tread at the face of the riser.

NOTE: Where codes specify handrails to be at heights other than 32 inches, it is recommended that two sets of handrails be installed to serve all people. Where traffic is predominantly children, particularly physically disabled children, extra care should be exercised in the placement of handrails in accordance with the nature of the facility and the age group or groups being serviced. Dual handrails may be necessary.

5.4.3 Stairs shall have at least one handrail that extends at least 18 inches beyond the top step and beyond the bottom step.

NOTE: Care should be taken that the extension of the handrails is not in itself a hazard. The extension may be made on the side of a continuing wall.

5.4.4 Steps should, wherever possible, and in conformation with existing step formulas, have risers that do not exceed 7 inches.

5.5 Floors

5.5.1 Floors shall have a surface that is nonslip.

5.5.2 Floors on a given story shall be of a common level throughout or be connected by a ramp in accord with 5.1.1 through 5.1.6, inclusive.

EXAMPLE 1: There shall not be a difference between the

Toilet Rooms. It is essential that an appro-
te number[8] of toilet rooms, in accordance with
nature and use of a specific building or facility,
nade accessible to, and usable by, the physically
dicapped.

.6.1 Toilet rooms shall have space to allow traf-
of individuals in wheelchairs, in accordance with
3.2, and 3.3.

.6.2 Toilet rooms shall have at least one toilet
that—

1) Is 3 feet wide
2) Is at least 4 feet 8 inches, preferably 5 feet, deep
3) Has a door (where doors are used) that is 32 inches wide and swings out
4) Has handrails on each side, 33 inches high and parallel to the floor, 1½ inches in outside diameter, with 1½ inches clearance between rail and wall, and fastened securely at ends and center
5) Has a water closet with the seat 20 inches from the floor

OTE: The design and mounting of the water closet is of siderable importance. A wall-mounted water closet with a ow understructure that recedes sharply is most desirable. floor-mounted water closet must be used, it should not e a front that is wide and perpendicular to the floor at front of the seat. The bowl should be shallow at the front he seat and turn backward more than downward to allow individual in a wheelchair to get close to the water closet the seat of the wheelchair.

.6.3 Toilet rooms shall have lavatories with nar-
aprons, which when mounted at standard height usable by individuals in wheelchairs; or shall e lavatories mounted higher, when particular de-
ns demand, so that they are usable by individuals wheelchairs.

IOTE: It is important that drain pipes and hot-water pipes er a lavatory be covered or insulated so that a wheelchair ividual without sensation will not burn himself.

.6.4 Some mirrors and shelves shall be provided
ve lavatories at a height as low as possible and higher than 40 inches above the floor, measured
m the top of the shelf and the bottom of the
rror.

.6.5 Toilet rooms for men shall have wall-

5.7 Water Fountains. An appropriate number[8] of water fountains or other water-dispensing means shall be accessible to, and usable by, the physically disabled.

5.7.1 Water fountains or coolers shall have up-front spouts and controls.

5.7.2 Water fountains or coolers shall be hand-operated or hand- and foot-operated. (See also American Standard Specifications for Drinking Fountains, Z4.2-1942.)

NOTE 1: Conventional floor-mounted water coolers can be serviceable to individuals in wheelchairs if a small fountain is mounted on the side of the cooler 30 inches above the floor.

NOTE 2: Wall-mounted, hand-operated coolers of the latest design, manufactured by many companies, can serve the able-bodied and the physically disabled equally well when the cooler is mounted with the basin 36 inches from the floor.

NOTE 3: Fully recessed water fountains are not recommended.

NOTE 4: Water fountains should not be set into an alcove unless the alcove is wider than a wheelchair. (See 3.1.)

5.8 Public Telephones. An appropriate number[8] of public telephones should be made accessible to, and usable by, the physically disabled.

NOTE: The conventional public telephone booth is not usable by most physically disabled individuals. There are many ways in which public telephones can be made accessible and usable. It is recommended that architects and builders confer with the telephone company in the planning of the building or facility.

5.8.1 Such telephones should be placed so that the dial and the handset can be reached by individuals in wheelchairs, in accordance with 3.3.

5.8.2 An appropriate number[8] of public telephones should be equipped for those with hearing disabilities and so identified with instructions for use.

NOTE: Such telephones can be used by everyone.

5.9 Elevators. In a multiple-story building, elevators are essential to the successful functioning of physically disabled individuals. They shall conform to the following requirements:

5.9.1 Elevators shall be accessible to, and usable by, the physically disabled on the level that they use to enter the building, and at all levels normally used by the general public.

5.9.2 Elevators shall allow for traffic by wheel-

American National Standard

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ARCHITECTURAL AND TRANSPORTATION BARRIERS COMPLIANCE BOARD

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A-200d

This checklist is based on the ANSI Standard. In some instances the language of the Standard was modified to quantify data or questions were added to more completely assess a particular aspect of a building. Other Federal, State, and privately developed standards were consulted in making the modifications. The modifications are identified by an asterisk.

Data shown for each question is based on our inspection of 314 buildings and/or building plans. Each question required a "yes," "no," or "not applicable" comment. "Not applicable" comments occurred where the particular building category under inspection was nonexistent or where the adequacy of that building category was impossible to determine from the building plans. Narrative comments and specific measurements requested during the inspections have been deleted to conserve space.

	Yes	No	Not applicable
SITE DEVELOPMENT			
Grading:			
* 1. Is the grading of the site, even contrary to existing topography, such that approaches to the building can be provided which are substantially level with building entrances?	234	20	60
Parking lots:			
* 1. Is there parking within 200 feet of the building entrance?	224	20	70
a. Is any of this parking identified as reserved for use by individuals with physical disabilities?	47	181	86
2. Are there any parking spaces open on one side, allowing room for individuals in wheelchairs or on braces to get in and out of an automobile?	52	145	117
3. If parking spaces for individuals with physical disabilities are placed between two conventional diagonal or headon parking spaces, are they at least 12 feet wide?	19	118	177
4. Is it unnecessary for individuals in wheelchairs or those using braces or crutches to wheel or walk behind parked cars?	46	176	92
5. Are the parking spaces located to allow persons to get in or out on a level surface?	158	8	148
* 6. Is there clear, level, or ramped path—void of curbs—from the parking lot to the building entrances?	114	121	79
Walks:			
1. Are walks at least 48 inches wide?	227	16	71
a. Is the gradient not greater than 5 percent (1-foot rise in 20 feet)?	208	26	80
2. Are walks of a continuing common surface, not interrupted by steps or abrupt changes in level?	198	40	76
3. Wherever they cross other walks, driveways, or parking lots, do walks blend to a common level?	144	81	89
* 4. Do walks that are elevated have a level platform at the top which is (a) at least 5-by-5 feet if a door swings out onto the platform or toward the walk or (b) 3-by-5 feet if door does not swing onto the platform?	130	24	160
* 5. Does the platform extend at least 1 foot beyond each side (inside and outside) of the doorway?	134	22	158
6. Do walks have a surface that is nonslip?	236	0	78
BUILDINGS			

3. If handrails are provided are they 32 inches from the surface of the ramp?	17	33	282
a. Are the surfaces smooth?	50	4	260
b. Do they extend 1 foot beyond the top and bottom of the ramp?	15	41	258
4. Do ramps have a surface that is nonslip?	105	4	205
5. Do platforms comply with questions 4 and 5 under the category of walks?	65	12	237
6. Do ramps have at least 6 feet of straight clearance at the bottom?	105	8	201
* a. Are level rest areas—a minimum of 5 feet in length—provided at turns?	20	4	290
7. Do ramps that exceed a gradient of 5 percent have level platforms—a minimum of 3 feet in length—at 30-foot intervals?	11	17	286
* a. Are level rest areas—a minimum of 5 feet in length—provided at turns?	15	2	297
Entrances/exits:			
1. Is at least one primary entrance to the building usable by individuals in wheelchairs? (It is preferable that all or most entrances (exits) should be accessible to and usable by individuals in wheelchairs or other forms of physical disability.)	234	74	6
2. Is at least one entrance usable by individuals in wheelchairs on a level that would make the elevators accessible?	157	21	136
Doors and doorways (interior and exterior doors):			
1. Do doors have a clear opening of no less than 32 inches when open?	187	66	61
2. Are doors operable by a single effort? Note: Two leaf doors are not usable by those with disabilities unless they operate by single effort, or unless one of the two leaves meets the 32-inch width.	204	40	70
3. Is the floor of the doorway level for a distance of 5 feet from the door in the direction it swings?	217	30	67
a. Does it extend 1 foot beyond each side of door?	196	52	66
b. Does it extend 3 feet in the direction opposite to the door swing?	240	6	68
c. Is the floor at least 5 feet wide?	232	16	66
4. Are sharp inclines and abrupt changes in level avoided at doorsills?	218	29	67
5. Does the speed of door closers allow the use of doors by physically disabled persons?	146	58	110
Stairs and steps:			
1. Do steps avoid abrupt nosing (Nosing is the protruding lip at the front edge of steps)?	135	51	128
2. Do stairs have handrails 32 inches high as measured from the tread at the face of the riser?	62	110	142
3. Do stairs have at least one handrail that extends at least 18 inches beyond the top and bottom step (parallel to floor or landing, and extension preferably secured to wall to avoid creation of a hazard)?	27	139	148
4. Do steps have risers 7 inches or less?	149	36	129
Floors:			
1. Do floors have a nonslip surface?	206	41	67
2. Are floors on each story at a common level or connected by a ramp? (There should be no differences in level between corridor and adjacent rooms.)	225	9	80

	b. is at least 4 feet, 8 inches (preferably 5 feet) deep?	236	33	2
	c. has a door that is 32 inches wide and swings out?	111	178	2
	d. has handrails on each side, 33 inches high and parallel to floor, 1½ inches in diameter, with 1½ inches clearance between rail and wall, fastened securely to the wall at the ends and center? If grab bars are other than parallel, describe.	117	159	3
*	e. has a clearance of at least 48 inches between the outside wall and the front of the stall entrance?	177	91	4
	f. has water closet with seat 20 inches from the floor?	93	208	1
*	5. Do toilet rooms have lavatories (wash basins) with narrow aprons, which when mounted at standard height are no greater than 34 inches at the top and which have a clearance underneath of 29 inches?	77	222	2
	6. Are drain pipes and hot water pipes covered or insulated?	104	179	3
*	7. Is one mirror at a height as low as possible and no higher than 40 inches above the floor?	74	211	2
*	8. Is one shelf at a height as low as possible and no higher than 40 inches above the floor?	82	146	1
	9. Do toilet rooms for men have wall-mounted urinals with the opening of the basin 19 inches from the floor, or have floor-mounted urinals that are level with the main floor of the toilet room?	43	220	5
	10. Do toilet rooms have towel racks mounted no higher than 40 inches from the floor?	8	45	26
	11. Are towel dispensers mounted no higher than 40 inches from the floor?	27	235	5
	12. Are other dispensers mounted no higher than 40 inches from the floor?	120	116	1
	13. Are disposal units mounted no higher than 40 inches from the floor?	206	54	5
*	14. Are towel racks, towel dispensers and other appropriate disposal units located to the side of the lavatory rather than directly above?	179	105	3
	Water fountains:			
*	1. Is there at least one drinking fountain on each floor for use by the physically handicapped?	185	96	3
*	2. Can persons in wheelchairs wheel up to the water fountain?	199	66	
	3. Do water fountains or coolers have up-front spouts and controls?	253	3	
	4. Are they hand operated?	263	3	
	5. If coolers are wall mounted, are they hand operated, with basins 36 inches or less from the floor?	49	164	1
	Public telephones:			
*	1. Is there at least one public telephone in each "bank' accessible to physically handicapped persons?	51		
	2. Is the height of the dial from the floor 48 inches or less?	21	111	1
	3. Is the coin slot located 48 inches or less from the floor?	4	122	1
	4. Are there telephones equipped for persons with hearing disabilities?	1	127	1
	a. Are those telephones identified as such?	1	0	3
	Elevators:			
	1. If more than a one-story building, are elevators available to the physically handicapped?	127	7	1
	2. Can physically handicapped persons, particularly those in wheelchairs, enter elevators?	124	2	1

* 5.	Are the buttons labeled with raised (or indented) letters beside them?	11	88	215
* 6.	Are they touch sensitive or easy to push?	102	1	211
7.	Is the cab at least 5-by-5 feet?	62	54	198
* 8.	Can a person in a wheelchair facing the rear see floor numbers (by mirror or floor identification number at rear of cab)?	3	107	204
* 9.	Are floors announced orally by recorded devices for the benefit of the blind?	3	110	201
	Controls:			
* 1.	Are light switches not more than 48 inches above the floor?	54	149	111
* 2.	Are controls for heating, cooling and ventilation not more than 48 inches above the floor?	18	64	232
* 3.	Are controls for fire alarms and other warning signals not more than 48 inches above the floor?	12	173	129
* 4.	Are controls for draperies and other items of frequent or essential use not more than 48 inches above the floor?	57	35	222
	Identification:			
1.	Are raised (*or recessed) letters or numbers used to identify rooms or offices?	112	80	122
2.	Is identification placed on the wall, to the right or left of the door?	47	122	145
	a. Is it at a height between 4 feet 6 inches and 5 feet 6 inches, measured from the floor?	74	73	167
3.	Are doors that might prove dangerous to a blind person if he were to exit or enter through them (doors not intended for normal use) made quickly identifiable to the touch by knurled door handles or knobs?	23	144	147
	Warning signals:			
1.	Are audible warning signals accompanied by simultaneous visual signals for the benefit of those with hearing or sight disabilities?	24	199	91
	Hazards:			
1.	When manholes or access panels are open and in use, or when an open excavation exists on a site, when it is approximate to normal pedestrian traffic, are barricades placed on all open sides at least 8 feet from the hazard, and warning devices installed?	79	14	221
2.	Are there no low-hanging door closers that remain within the opening of a doorway, or that protrude hazardously into regular cooridors or traffic ways?	170	39	105
3.	Are there no low-hanging signs, ceiling lights, fixtures, or similar objects that protrude into regular corridors or traffic ways? (A minimum height of 7 feet, measured from floor is recommended.)	172	38	104
4.	Is lighting on ramps adequate?	109	8	197
5.	Are exit signs easily identifiable to all disabled persons?	174	35	105

We selected several architectural barriers common to many DOD facilities and asked Army Corp Engineers' personnel to estimate the cost of eliminating selected barriers. Options are available in s cases, as shown in the following table.

Estimated Average Costs to Remove Selected Barriers in DOD Buildings

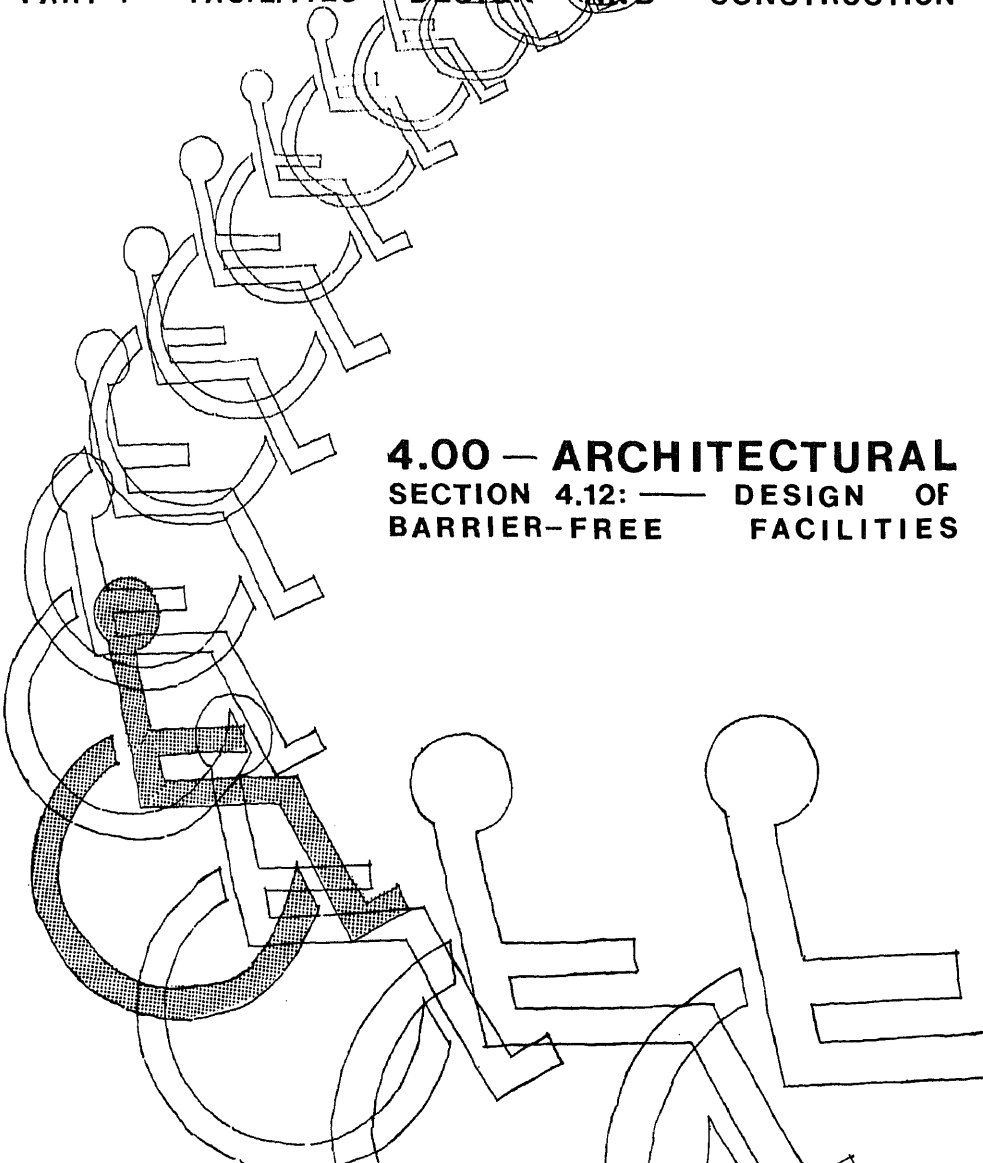
Barrier	Cost to remove barrier by alteration	Cost to make accessible initially
No handicapped parking:		
Designation sign	$ 100	$ 100
Provide one space	45	—
Curb cut:		
4-foot curb cut	260	25
Cost per each additional foot	50	—
Narrow doors:		
Widen exterior double door (5 feet to 6 feet)	650	25
Widen interior single door	500	15
Provide asymetrical interior double door	450	—
Provide automatic door w)swinging type)	1,600	1,200
Inaccessible watercloset seat:		
Raise existing watercloset seat:		
Floor mounted:		
with no wallwork	150	—
with wallwork	200	—
Wall mounted (includes wallwork)	200	—
Provide extra thick seat	110	110
Provide dual-purpose seat	60	60
Inaccessible urinal:		
Lower wall mounted urinal	200	—
No grab bars:		
Provide grab bars in toilet stall	120	120
Improper toilet stall:		
Provide 36-inch-wide toilet stall with 32-inch door that swings out	300	20
Inaccessible restroom lavatory:		
Relocate existing lavatory	250	—
Replace with handicapped lavatory	460	210
Inaccessible restroom stainless steel shelves:		
Lower existing shelf	50	—
Purchase and install new shelf	50	50
Purchase and install new shelf in toilet stall	40	40
Lower existing combination mirror and shelf	60	—
Purchase and install combination mirror and shelf	80	80

Comparative Costs to Remove Barriers by Alteration and Initial Construction

Agency	Building/location	Project cost	Estimated cost of remove barriers by alteration	Percent of project cost	Estimated added cost to make accessible initially	Percent of project cost
Navy	Chief Petty Officer's Club, Newport, R. I.	$ 1,315,956	$ 10,800	.82	$ 2,880	.22
Navy	Electronic Weapons Precision and Engineering Facility, Philadelphia Navy Yard, Pa.	11,696,618	282,000	2.41	65,300	.56
HEW	Horizon House, Philadelphia, Pa.	712,500	11,130	1.56	5,315	.75
HEW	Pennsylvania College of Podiatric Medicine, Philadelphia, Pa.	9,010,627	39,138	.43	10,853	.12
HUD	Germantown House, Philadelphia, Pa.	4,808,272	3,000	.06	500	.01
HUD	Compton Towers, Wilmington, Del.	3,577,398	9,000	.25	500	.01
GSA	Dover Federal office building, Dover, Del.	1,826,500	16,605	.91	2,605	.14

In some cases, there is no added cost associated with original barrier-free construction. The following table presents cost data for selected items.

Barriers	Cost to remove barriers by alteration	Added cost to make accessible initially
Lower restroom mirror	$ 36	—
Lower wall rail on stairs	1,620	—
Lower fire alarm control	20	—
Lower urinal	280	—



4.00 — ARCHITECTURAL

SECTION 4.12: —— DESIGN OF BARRIER-FREE FACILITIES

FOREWORD

This handbook, Part 4, Series 4.12, Design of Barrier-Free Facilities, is for use in all DHEW facilities programs.

The material in this handbook supplements and amplifies Federal Property Management Regulation 101-17 and American National Standard A117.1-1961 (R1971). It is presented in a checklist format designed to be useful in administering the regulations.

It is recognized that a number of agencies and institutions are presently conducting research and developing new data concerning barrier-free design. As soon as authoritative new material is available it will be incorporated into this handbook.

This handbook was developed by the Office of Facilities Engineering and Property Management/Assistant Secretary for Administration and Management, with the concurrence of the Assistant Secretary for Human Development and the Chairman, Architectural and Transportation Barriers Compliance Board.

Recommendations or suggestions for the improvement of this handbook are invited and should be sent to:

Director – Office of Architectural and Engineering Services
OFEPM/DHEW
330 Independence Avenue, S.W.
Washington, D. C. 20201

Approved for DHEW facilities by:

Gerrit D. Fremouw, P.E.
Director
Office of Facilities Engineering and
Property Management

ACKNOWLEDGMENTS

A draft of this handbook was reviewed by the representatives of various organizations interested in barrier-free design. All comments and suggestions were carefully considered and many were adopted. Some recommendations were found to be in conflict with ANSI A117.1 or the majority of the reviewers and therefore were not used. Comments from the following sources are gratefully acknowledged:

American Association on Mental Deficiency
American Institute of Architects
California Department of Rehabilitation
Easter Seal Society (Seattle, Washington, Office)
General Services Administration
Industrial Designers Society of America
National Society of Interior Designers
Paralyzed Veterans of America
President's Committee on Employment of the Handicapped
President's Committee on Mental Retardation
State Department of Works, Brisbane, Australia
U.S. Department of Health, Education, and Welfare
- Assistant Secretary for Human Development
- Health Resources Administration, Division of Facilities Utilization (Hill-Burton)
- Office of Facilities Engineering and Property Management—The 10 Regional Offices
- National Institute of Mental Health
- Social and Rehabilitation Service

U.S. Department of Housing and Urban Development
Veterans Administration

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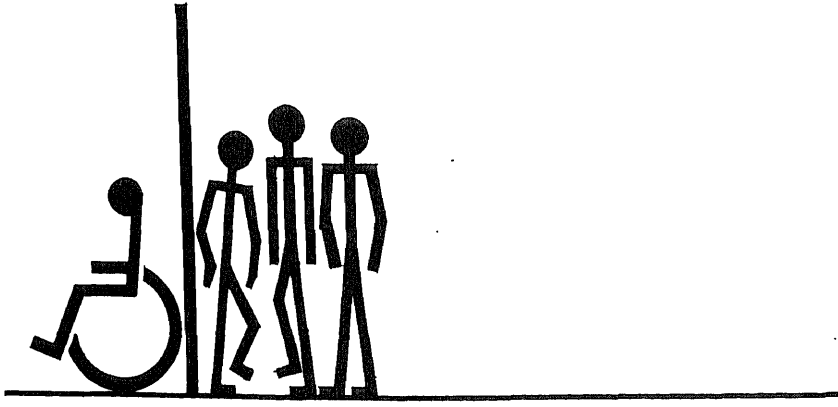
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APPENDIX: WHEELCHAIR CRITERIA

HOW TO USE THIS HANDBOOK

At the front of this handbook is a checklist which forms a concise summary, using key phrases, of the major criteria contained in the text. The number to the right of each phrase refers to a paragraph in the handbook which more fully describes the requirements for that item. The checklist may be used to assess the conformity of a specific project or an existing facility.

An asterisk at the left of an item indicates that the item is covered specifically by the ANSI A117.1 Standard.



CHECKLIST FOR BARRIER-FREE DESIGN

PROJ. NO._____ INSTITUTION_____ BLDG. NAME_____

ADDRESS_____ CITY_____ STATE _____ C.D._

*Mandatory item covered by ANSI A117.1 Standard

	Passenger Arrival	
	____ Adequate Place	(2.1)
	Parking	
	____ Special stalls with pedestrian access and controls	(2.2.4)
*	____ Accessible to building by level or ramped path	(2.2.5)
	Walks	
*	____ 48" wide minimum	(2.3.1)
*	____ 5% maximum gradient (rest areas if greater than 3%)	(2.3.2)
*	____ Firm, non-slip materials	(2.3.3)
*	____ Free of gratings, manholes, etc.	(2.3.4)
*	____ Curb cuts at streets, driveways, parking lots	(2.3.5)
*	____ Level platforms at doors	(2.3.6)
	Ramps (Exterior and Interior)	
*	____ 8.33% maximum gradient (1 foot rise in 12 feet)	(2.4.2)
*	____ Firm, non-slip surfacing	(2.4.3)
	____ Free of gratings	(2.4.4)
*	____ Level approaches, Landings at 30 ft. intervals	(2.4.5-6)
*	____ Handrails 32" high, extend 12" beyond ramp	(2.4.7)
	____ Guardrails or walls	(2.4.8)
	____ Well illuminated	(2.4.9)
	Entrances	
*	____ At least one major entrance accessible by wheelchair	(3.1)
	____ Level approach platform	(3.1.2)

Doors

*	____32" wide clear opening	(3.2.1)
*	____Single effort with 8 lbs. pressure maximum	(3.2.1)
*	____Level approaches and clearance at sides of door	(3.2.3)
	____Vestibules with 6'–6" separation between doors	(3.2.4)
*	____Thresholds flush or beveled at 8% maximum slope	(3.2.5)
	____Kickplates 16" high	(3.2.6)
	____Closers with time delay and 8 lbs. maximum tension	(3.2.7)
	____Handles maximum 42" height	(3.2.8)
	____Vision panels at 36" maximum above floor	(3.2.9)

Corridors, Public Spaces, Work Areas

	____Corridors 60" minimum width	(3.3.1)
	____Recessed doors when opening into corridors	(3.3.2)
*	____Floors on common level	(3.3.4)
*	____Non–slip floor materials; non-carpeted circulation paths; transition strips	(3.3.5)

Stairs

	____42" minimum width	(3.5.1)
*	____7" maximum risers	(3.5.2)
*	____Non-projecting nosings	(3.5.3)
	____Non-slip treads	(3.5.4)
	____Level, differentiated approaches	(3.3.5)
*	____Handrails 32" high, 18" beyond top & bottom steps	(3.5.6)
	____Well illuminated	(3.5.7)

Elevators

*	____Accessible to each floor level	(3.6.1)
*	____Cab size minimum 60" x 60" or 63" x 56"	(3.6.3)
*	____Door clear opening 32" minimum	(3.6.4)
	____Handrails at 32" high	(3.6.5)
*	____Automatic and self-leveling	(3.6.6)
	____Doors with safety closing devices	(3.6.7)
	____All controls 48" maximum from floor	(3.6.8)
	____Controls and signals usable by blind persons	(3.6.2;3.6.8)
	____Emergency routes and plans	(3.6.10)

Toilet Facilities

	____Minimum 1 per sex per floor	(3.7)
*	____Entrance clearances (door widths, vestibule size)	(3.7.1)
*	____Floor level with corridor	(3.7.2)
	____Side transfer compartment, 66" wide x 60" deep, OR	(3.7.4)
	*____Compartment 36" x 56" with 32" clear opening	(3.7.5)
*	____Grab Bar(s) at side of w.c., 33" high	(3.7.4;3.7.5)
*	____Wall-hung w.c., 20" high	(3.7.4;3.7.5)
*	____Lavatory with 30" clear space underneath	(3.7.6)
*	____Faucets easily operated, pipes insulated	(3.7.6)
*	____Urinal wall-mounted at 19", or at floor level	(3.7.7)
*	____Mirrors, shelves, dispensers usable fromlav. at 40" max. ht.	(3.7.8–9)
	____Shower stalls with folding seats, grab bars, special controls.	(3.7.10)

Drinking Fountains

____Minimum one per floor for handicapped

* ____Hand lever operated with up-front jet and controls

____Wall-mounted, projecting basin at 33" maximum ht

____Alcoves 60" wide if used

Public Telephones

* ____At least one per bank accessible

* ____Dial, handset & coin slot maximum 48" high

* ____One per bank for hard-of-hearing

Controls

* ____Alarms, switches, etc. within 48" of floor

Identification and Warning

____Access symbol displayed at entrances

* ____Raised numerals 60" high at sides of doors

* ____Knurled door handles at danger areas

____Abrasive floor strips at open danger areas

* ____Warning signals both visible and audible

* ____Construction site barricades

Special Use Spaces

____Dining Areas: access & clearances

____Spectator Spaces: wheelchair stations

____Laboratories: wheelchair stations

____Libraries: wheelchair access & clearances

____Audio-Visual Control Rooms: access

____Bedrooms: clearances, furniture, storage

CHAPTER 1 – GENERAL INFORMATION

1.1 Purpose and Scope

This handbook is intended to aid building designers, program officials, grantees, and facilities managers in eliminating architectural barriers to the physically handicapped in both existing and new facilities. Application of these guidelines should permit access to and free movement within DHEW facilities by persons with a wide range of disabilities.

Public Law 90-480 and subsequent implementing regulations require all DHEW projects to comply with the American National Standard A117.1-1961 (Reaffirmed 1971) titled "Specifications for Making Buildings and Facilities Accessible to, and Usable by, the Physically Handicapped." The material in this handbook is based principally, but not entirely, on this standard. Paragraphs specifically covered by the standard are marked with an asterisk. (*)

The use of the word "shall" or "must" in the text indicates that the item is required in order to conform to Public Law 90-480. The word "should" indicates that the item is highly recommended as a means of making the environment accessible.

This material applies to all DHEW and DHEW-sponsored buildings. The numerical need for a specific item may vary with the type of building. Careful application of these criteria will be required to satisfy the needs of the handicapped and yet avoid costs that are at great variance with the benefits received.

In most new construction, the additional cost of making a facility barrier-free is negligible and should not interfere with the application of these standards. The remodeling of existing structures does involve additional costs which vary widely.

Where it is determined by the building designer (the A/E) that full compliance with this handbook is impractical, it is suggested the designer submit a list of non complying items and the reasons for noncompliance. (See FPMR 101-17.704, "Exceptions").

1.2 The Handicapped Population

Physical disability is a national problem affecting millions of people in all parts of the country, in all age groups, and in all occupations. Degree of disability ranges from the wheelchair-bound paraplegic to the athlete temporarily on crutches with a broken leg. Those whose mobility is impaired - wheelchair and crutch users, the arthritic, aged, blind and deaf - comprise about 12% of the U.S. population, a minority of significant proportions.

1.2.1 Types of Disability

The term "physically handicapped," as used in this handbook, includes persons in the following categories:

a. Non-ambulatory disabilities - those which confine the individual to a wheelchair.
b. Semi-ambulatory disabilities - those which allow the individual to walk with difficulty, perhaps with the aid of braces or crutches. This may include amputees, arthritics, victims of stroke and partial paralysis, cardiac and pulmonary patients, and the grossly over-weight.

c. Disabilities of incoordination or palsy due to brain or nerve injury, which impair the individual's mobility.
d. Sight disabilities - blindness or impaired visual ability to perceive signals or dangerous situations.
e. Hearing disabilities - deafness or impaired ability to hear warning signals or communicate.
f. General disabilities due to aging, which reduce the individual's mobility, perception, and coordination.
g. Temporary disabilities due to broken limbs, sprains, illness, pregnancy, etc.

Mental retardation is not included as such in this list of physical handicaps. However, many mentally retarded individuals have impaired physical abilities and benefit from barrier-free design.

1.2.2 An Increasing Population

The number of handicapped persons has increased as the general population has grown, as traffic accidents have risen, as war veterans have come home, and as medical knowledge and care have improved. Prior to World War II, a man with a severed spinal cord had a life expectancy of six months from the date of injury. Today he may be expected to live a full chronological life, often in a wheelchair. Modern medicine has similarly improved the outlook for those with many other disabilities. This means not only more surviving handicapped but also a more mobile, energetic, and able handicapped population.

1.2.3 An Economic Resource

Federal, state, and local governments are spending millions of dollars each year in vocational rehabilitation programs to help restore disabled youth and adults and return them to productive lives. This important national investment has produced impressive good work habits and comparatively few absences.

Unfortunately, too many jobs are off limits to the handicapped merely because they are located in buildings made inaccessible by architectural barriers: stairs and curbs, revolving doors, narrow restroom doors, inaccessible elevators, too-high telephones, drinking fountains, and light switches, slippery floors, steep ramps or walks, and distant parking. The physical design of the facilities they must use is the greatest single obstacle to the handicapped —more so than the disabilities per se. The value to society of having the disabled population more fully independent and usefully employed outweighs the relatively small cost of making facilities accessible.

1.2.4 Psychological Barriers

As more and more of the physically handicapped become active participants in community life, accommodating them becomes a crucial problem. Most disabled persons want to be as self-sufficient as possible. They are trained and equipped to care for themselves, even drive cars, and yet find themselves dependent on others to enter and use most public facilities.

Architectural barriers tend to force the handicapped into seclusion rather than subject themselves to the dangers, discomforts, and humiliation they often encounter in contact with non-disabled people. Public unawareness or apathy toward their environmental problems can only be interpreted as cruelly thoughtless discrimination, effectively reducing them to being second-class citizens.

The handicapped person does not want to be the object of misdirected pity. He simply wants to be an individual, to move about as he chooses, and to contribute what he can. Owners, designers, and managers of buildings can no longer

CHAPTER 2 – SITE CONSIDERATIONS

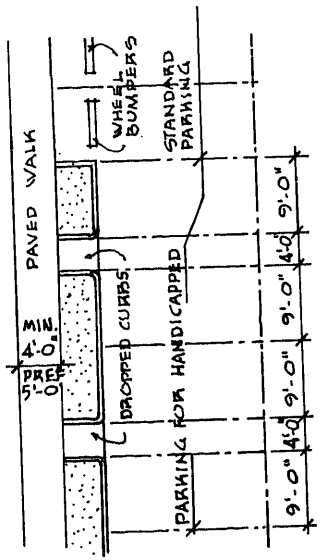
2.1 Passenger Arrival

A safe place, located either on or off the street, should be designated for passengers to get into and out of cars.
It should be:

2.1.1 As near as possible to the building entrance provided for the handicapped.
2.1.2 Zoned to prohibit parking.
2.1.3 Provided with a ramp to sidewalk level, if located at curbside.
2.1.4 Protected from weather by canopy over entrance.

2.2 Parking

Special parking spaces shall be provided in accordance with the frequency and persistency of use by the handicapped. It is suggested that not less than one percent of all parking spaces in any project (with a minimum of two spaces) be so designated.
Spaces provided must be:



* 2.2.1 As near as possible to the building entrance provided for the handicapped, with a maximum travel distance of 200 feet.

* 2.2.2 Identified and controlled for use by individuals with physical disabilities. (NOTE: See Section 3.11.1 for wheelchair symbol).

* 2.2.3 Planned so that travel behind parked cars or across traffic lanes is not necessary.

* 2.2.4 A minimum of nine feet in width, with a four-foot wide pedestrain access aisle on one side of the space.
(NOTE: Spaces parallel to a curb (4 inch high maximum) on the building side of the parking area are desirable. If perpendicular parking is necessary, four-foot wide access aisles between every other

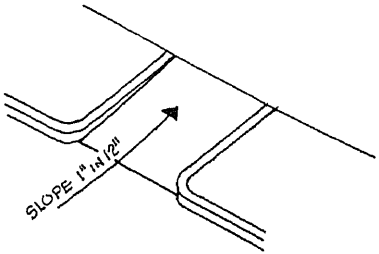
2.2.5 Substantially level, (1/8 inch per foot slope for drainage) suitable for wheeling and walking, and accessible to the building by a clear, level or ramped path of travel. (See Section2.3)

2.3 Walks

Public walks should be made to form a continuous surface uninterrupted by steps or abrupt changes in level. To be usable by the physically handicapped a walk must be:

* 2.3.1 48 inches wide minimum. (60 inches is preferable).

* 2.3.2 Level where possible, but with a maximum gradient of 5%. Where gradient exceeds 3%, level rest areas must be incorporated at 60 foot (maximum) intervals. For gradients over 5%, see "Ramps". (NOTE: Walks which slope to the side are difficult to manuever in a wheelchair).



* 2.3.3 Constructed of firm, fixed non-slip materials with a minimum of joints.

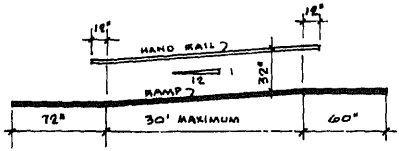
2.3.4 Free of gratings, manholes and similar impediments. (If a grating cannot be avoided, it must contain no openings greater than 3/4 inch in any dimension).

* 2.3.5 Brought gradually (at 8% maximum pitch) to a common level with other walks, driveways, streets, and parking lots. (NOTE: This does not require the elimination of curbs, which should mark boundaries between safe and unsafe areas, particularly for the blind. See illustration for preferred design of "curb cuts".)

* 2.3.6 Provided with a level platform extending at least 5 feet beyond a door swing and at least one foot beyond each side of the door opening.

2.3.7 At the same level as the surface of the adjacent ground. Handrails 32 inches high should be provided where the grade drops abruptly within three feet of the walk.

2.4 Ramps



Where a ramp with a gradient of 5 to 8 percent is necessary, it must be:

2.4.1 The same width as the walk or corridor it serves (48 inches minimum).

* 2.4.2 Kept to a maximum gradient of 8.33 percent, or one foot rise in 12 feet of run.

* 2.4.3 Constructed of firm, fixed, non-slip materials. (Concrete surfaces should be broom finished.)

2.4.4 Free of gratings or other openings if possible. (If a grating cannot be avoided, it must contain no openings greater than 3/4 inch in any dimension).

* 2.4.5 Provided with a level platform at least 60 inches at the top and a straight, level clearance of at least 72 inches at the bottom of the ramp.

* 2.4.6 Provided with level landings - a minimum of 60 inches in length - at 30 foot maximum intervals and at all changes in direction, intersections with other ramps, paths, doors, etc. (See section 3.2.3 for doors opening onto ramps).

* 2.4.7 Provided with handrails 32 inches in height on at least one side and preferably both sides. The rails must be smooth, at least 1-1/2 inches clear of walls, and extend at least 12 inches beyond the top and bottom of the ramp. (NOTE: Where a handrail of a different height is required by code, a second rail should be installed at 32 inches. Where ramp will be used frequently by children, provide an additional rail at 16 to 18 inches, depending on the age group being served).

2.4.8 Provided with guard rails 32 inches high and curbs 2 inches high (or with a 32 inch high wall) where there is a drop in grade from either side of the ramp.

2.4.9 Well illuminated.

2.4.10 It is suggested that ramps be provided with protective canopies or automatic snow melting systems where they are exposed to the weather and where freezing weather is expected.

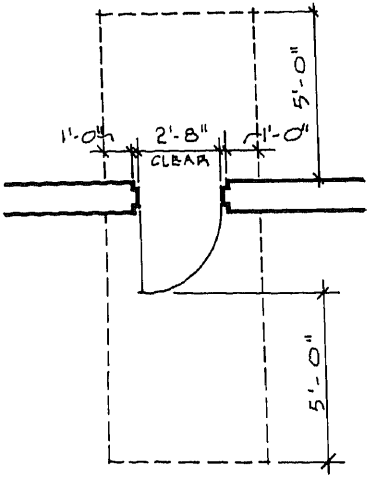
CHAPTER 3 – BUILDINGS

3.1 Entrances

* At least one primary entrance to a building (not the service entrance) must be usable by persons in wheelchairs. All major entrances should be usable by the physically handicapped, since they also serve as required emergency exits.

* 3.1.1 In a multi-story building, at least one wheelchair entrance must be located on a level accessible to the building elevators.

3.1.2 A level approach platform is required at each entrance. It must extend at least 5 feet from the door swing and at least one foot beyond each side of the door opening. (See illustration)



3.1.3 Turnstiles: When turnstiles are required for access, consideration must be given to an alternate means of access for wheelchairs which does not require disruption of traffic, stoppage of work, and assistance from other people. This might be done with a swinging gate or removable railing which can be electrically released by a nearby cashier.

3.1.4 Where revolving entrance doors are used, additional side-hung doors which conform to Section 3.2, must be provided adjacent to the revolving doors.

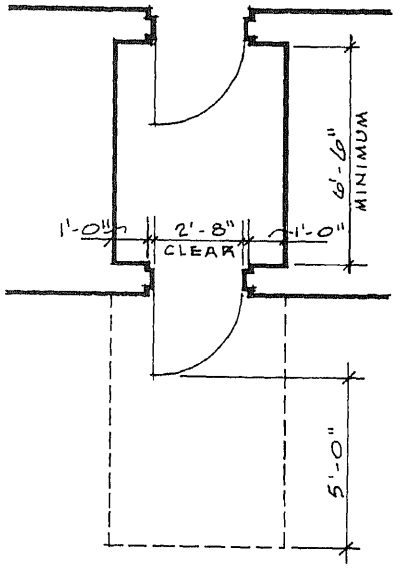
3.1.5 Vestibules must conform to Section 3.2.4.

3.1.6 All usable entrances should be identified by the International Symbol of Access (See Section 3.11.1).

3.2 Doors (Exterior and Interior)

Automatic doors are desirable if they otherwise conform to this section. Sliding doors are acceptable if they meet the requirements below and if careful attention is paid to hardware. Recessed handles should be avoided.

* 3.2.1 Doors must have a clear opening of at



more than eight pounds pressure to open. (Five pounds is preferable). (NOTE: A 32 inch clear opening requires a door wider than 32 inches).

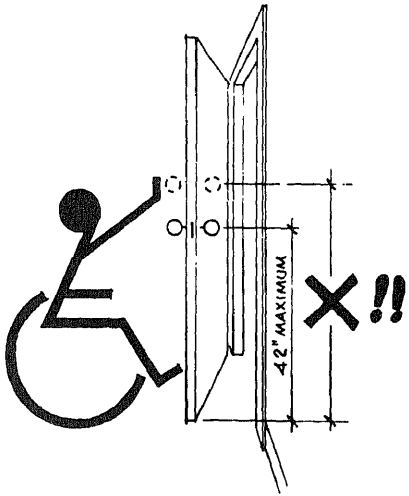
* 3.2.2 Two-leaf doors are not acceptable unless they open with a single effort, or unless one of the leaves provides a minimum clear opening of 32 inches.

* 3.2.3 The floor on both the inside and outside of a doorway must be level for a distance of at least five feet from the door swing. The floor must extend at least one foot beyond each side of the door.

3.2.4 A series of two doors (for example, a vestibule with outer and inner doors) must be separated by a minimum of 6 feet 6 inches so that a wheelchair cannot be trapped between the two doors.

* 3.2.5 Thresholds must be flush with the floor if possible. Where necessary, they must be beveled gradually from both sides at an 8% maximum slope.

* 3.2.6 Kickplates at least 16 inches high are recommended where wheelchair traffic is prevalent.

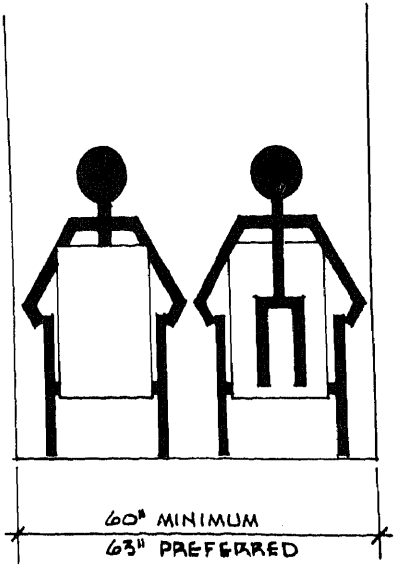


* 3.2.7 Door closing devices must be selected and installed to allow use of doors by the handicapped. Maximum pressure on a door to resist the closer must not exceed 8 lbs. (5 lbs. is preferable). The closing mechanism should provide a 4 to 6 second time delay.

3.2.8 Handles should be mounted 42 inches or less above the floor. (Panic devices should be 32 inches above the floor). In danger areas handles and panic bars should be knurled to serve as warning to the blind. See Section 3.11.3.

3.2.9 Vision panels are desirable in all swinging doors. When provided, the glass must be the safety type and the bottom of the glass should be no more than 36 inches above the floor. (NOTE: A narrow vertical view panel 6 to 8 inches wide at the latch side of the door is effective).

3.2.10 Door identification - See Section 3.11.



3.3 Corridors, Public Spaces and Work Areas

All public spaces in a building should be designed to accommodate the physically handicapped.

3.3.1 Corridor width must be a minimum of 60 inches for wheelchair maneuverability. (63 inches is preferred).

3.3.2 Doors opening into corridors from habitable areas should be recessed, so as not to reduce the corridor width. (Recesses should conform to Section 3.2.3).

3.3.3 Corridors should have a minimum clear height of 84 inches, free of hanging or protruding signs, lights, or other fixtures.

* 3.3.4 Floors must be on a common level throughout a given story, or connected by properly designed ramps.

* 3.3.5 Floors must be constructed of non-slip materials with a continuous uninterrupted surface.

3.3.5.1 Avoid access panels, grates, etc. in floors. (See Section 2.4.4)

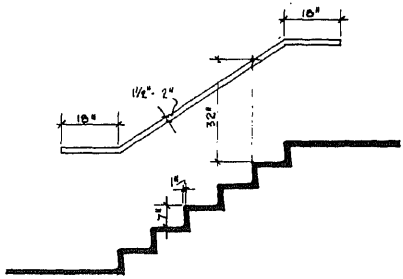
3.3.5.2 Carpeting in public or general office areas should be be heavy duty type with a tight weave and low pile, preferably installed without padding.

3.3.5.3 Floors of primary circulation paths should have a hard surface (such as vinyl asbestos tile) which permits easy movement of wheelchairs. Travel distance over carpeting required to reach such a path should not exceed 50 feet.
(NOTE: This applies particularly to open-space office areas, where access paths through carpeted areas may be required).



3.3.5.4 Metal or resilient transition strips are required where carpet adjoins another flooring material and is not flush with that material. See threshold requirements, Section 3.2.5.

3.4 Ramps See Section 2.4.



3.5 Stairs

Although stairs are a barrier to many of the physically handicapped, they can be used by those with certain disabilities and by the aged if they conform to the following provisions:

3.5.1 Width should be a *minimum* of 42 inches between handrails.

* 3.5.2 Risers should be no more than 7 inches high.

* 3.5.3 Nosings must not project beyond the face of the riser. Splayed risers are preferred, with non-projecting nosings. (See Illustration).

3.5.4 Treads should be of a non-slip material.

3.5.5 Approaches and landings should be level, and differentiated from the stairs by contrasting color or texture.
(NOTE: Open stairs should be provided with a means of warning the blind of their existence, such as slightly raised abrasive strips at the approach).

* 3.5.6 Handrails at 32 inches high (measured vertically from stair nosing) are required on both sides of the stair. Rails should be circular or oval in section, 1-1/2 inches to 2 inches in diameter and have a non-slip finish. At least one handrail must extend at least 18 inches beyond both the top and the bottom step.
(NOTE: For rails on stairs used primarily by children see 2.4.7).

3.5.7 Stairs must be well illuminated.

3.6 Elevators

In multi-story buildings, elevators are necessary for the mobility of the physically handicapped. They must be designed to accommodate wheelchair traffic as follows:

* 3.6.1 Elevators must be accessible at the level of a major building entrance which is usable by the handicapped. These elevators must give access to all building

3.6.2 Call buttons should be centered at 40 inches above the floor. Lobby indicators should signal elevators going up with a higher pitch sound and elevators going down with a lower pitch sound.

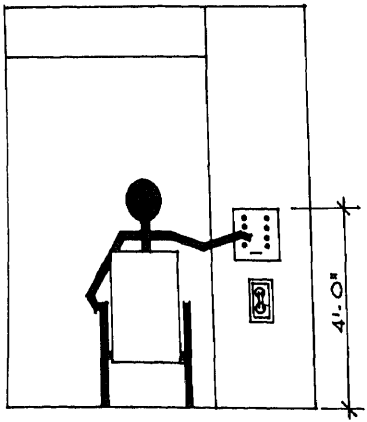
* 3.6.3 Cab size must allow for the turning of a wheelchair. It should measure at least 60 x 60 inches square or 63 inches by 56 inches.

* 3.6.4 Door clear opening width must be 32 inches minimum.

3.6.5 A handrail at 32 inches from the floor should be provided on at least one side of the cab and preferably on the back and two sides.

3.6.6 Operation must be automatic, the cab stopping precisely at floor levels with a self-leveling feature.

3.6.7 Doors shall be fitted with a sensitive safety edge.



3.6.8 All essential controls must be within 48 inches from the cab floor. They should be usable by the blind, featuring raised numerals and "pop out" action on floor selection buttons.

3.6.9 An emergency telephone (with no dial) should be mounted low enough (48 inches maximum) for use by children and the handicapped.

3.6.10 Emergency use: Elevators cannot be considered as exits in an emergency. A definite plan is required to assist the physically handicapped, particularly those in wheelchairs. This might include alternate routes of exit, areas of refuge within the building, and the assistance of designated persons.

3.7 Toilet Facilities

At least one toilet room for each sex on each floor shall be accessible to and usable by the physically handicapped. Such toilet rooms must meet the following requirements:

* 3.7.1 Entrance vestibules, doors, and vision screens must allow sufficient clearance for wheelchair passage. Entrance doors

Vestibule doors must be at least 6 feet 6 inches apart. (See Section 3.2.4).

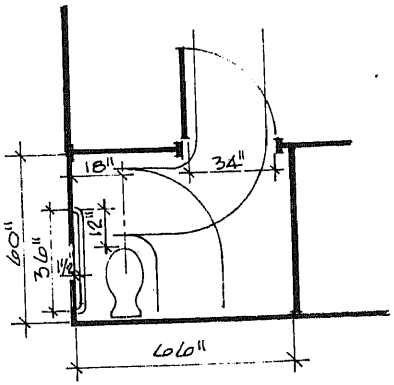
* 3.7.2 The floor of the toilet room shall be at the same level as the corridor floor outside. Thresholds must conform to Section 3.2.5.

3.7.3 The room must contain a clear floor area of at least 60 x 60 inches to permit the turning of a wheelchair.

3.7.4 Side transfer toilet compartment: (See Illustration). At least one stall in each toilet room serving the handicapped should have:

3.7.4.1 A minimum width of 66 inches and a depth of at least 60 inches.

3.7.4.2 A 34 inch wide clear opening at the front of the stall with an outswinging door. (An opaque curtain may be used.)



3.7.4.3 A wall-mounted grab bar on one side, 1-1/2 inches clear of the wall, and mounted securely 33 inches above the floor. (NOTE: In facilities containing multiple sets of toilet rooms, the location of grab bars and water closets should be alternated between right and left sides of compartments).

3.7.4.4 One water closet with seat 20 inches above the finished floor, centerline located 18 inches from the side wall on which the grab bar is located. A wall-mounted model is preferred; if a floor-mounted model must be used, the under-structure must not interfere with the close approach of a wheelchair.
(NOTE: There is substantial controversy over the advisability of mounting water closets for the handicapped higher than normal - i.e., 20 inches above the floor).

3.7.5 As an alternative to the preferred side-transfer compartment described above, the compartment may have:

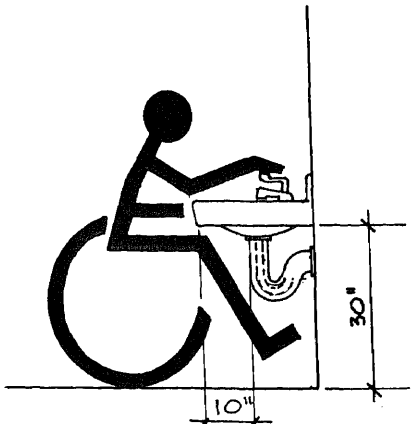
* 3.7.5.1 A minimum width of 36 inches (42 inches is preferred) and a depth of at least 56 (and preferably 60) inches.

* 3.7.5.2 A clear opening at the front of the stall at least 32 inches wide (34 inches is preferable) with a door that swings out. (An opaque curtain may be used in place of a door).

* 3.7.5.3 Wall-mounted grab bars on each side, 1-1/2 inches in diameter, 52 inches long, 1-1/2 inches clear of the wall, and mounted securely 33 inches above the floor.

* 3.7.5.4 A water closet with seat 20 inches above the floor and centered on the rear wall of the compartment. A wall-mounted model is preferred; if a floor-mounted model must be used, the understructure must not interfere with the close approach of a wheelchair.

(NOTE: This alternate method conforms with the ANSI, A117.1 - 1961 Standard but does not provide adequately for the wheelchair as does the side transfer stall.)



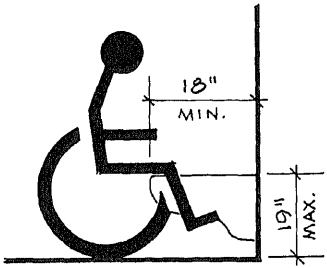
3.7.6 Lavatories: At least one lavatory in each toilet room serving the physically handicapped shall be:

* 3.7.6.1 Wall-mounted to provide a 30 inch clear space below the bottom of the fixture for a depth of 10 inches from the face of the fixture.

single lever-type handles not requiring hand grip should be used.

* 3.7.6.3 Insulated or protected so that wheelchair occupants without leg sensation cannot be burned by hot water pipes or drains.

* 3.7.7 At least one urinal in men's toilet rooms shall be wall-mounted with the rim 19 inches above the floor and projecting at least 18 inches from the wall. Floor mounted urinals are acceptable if they are at the same level as the main floor of the toilet room.

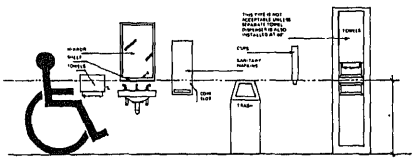


* 3.7.8 Mirrors and shelves shall be mounted above wheelchair type lavatories at as low a height as possible, but not to exceed 40 inches from the bottom of the mirror to the floor. As an alternate method the mirror may be tilted forward slightly to permit viewing from a wheelchair.

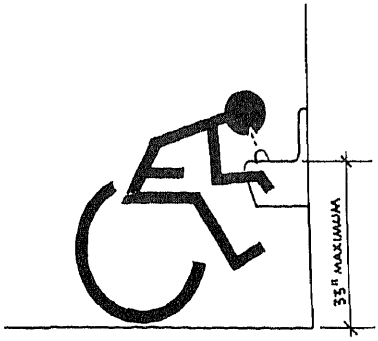
* 3.7.9 Towel dispensers, towel racks, other dispensers and disposal units must be mounted no higher than 40 inches above the floor. They must dispense multifold, interlocking type paper towels. (NOTE: Towel dispensers should be located within easy reach from the lavatory without moving the wheelchair)

3.7.10 Shower stalls, where provided for the physically handicapped, should be square, measure at least 36 inches on each side with a 36 inch minimum door opening, a non-slip floor surface, and no curb. Stalls should be equipped with the following:

3.7.10.1 Two folding seats (right and left sides) mounted 19 inches high. (NOTE: Where two or more stalls are provided, one seat per stall; one righthand, the other lefthand, is sufficient.)



3.7.10.2 A grab bar at 33 inches high, securely attached to the wall opposite the seat and extend-



mounted a maximum of 42 inches above the floor. Controls should be lever or wrist type, operable from outside as well as inside the stall.

3.7.10.4 A hand held shower head fixture with on/off control as an integral part of the hand held unit. This unit must be mounted on flexible metal tubing not less than 60 inches in length.

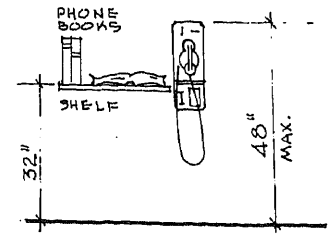
3.8 Drinking Fountains

At least one drinking fountain designed for use by the physically handicapped shall be provided at an accessible location on each floor.

* 3.8.1 The fountain must be hand lever operated or hand and foot operated with up-front water jet and controls.

* 3.8.2 A wall-mounted model with a 12 inch projecting basin is preferred. The rim of the basin should be no more than 33 inches from the floor. This type can serve both the able-bodied and the disabled equally well. Fully recessed models are unacceptable.

3.8.3 A 60 inch wide alcove is a preferable location for a drinking fountain.



3.9 Public Telephones

In any "bank", at least one public telephone should be accessible to wheelchair users, (Standard telephone booths are not usable by most physically handicapped persons).

3.9.1 The local telephone company should be consulted for information on models which can be installed outside booths.

* 3.9.2 The dial, handset and coin slot must be

mum of 36 inches long.

* 3.9.3 At least one telephone in any "bank" should be identified and equipped with an amplifier for use by those with hearing disabilities. (NOTE: These telephones can be used by everyone).

3.10 Controls

All essential or frequently used controls shall be located within reach of wheelchair users. (NOTE: There is some controversy over the necessity of having fire alarms, extinguishers, and electrical outlets specially located for use by the handicapped. However, ANSI A117.1 requires that controls, including fire alarms, be placed within reach of wheelchair users.)



* 3.10.1 Fire alarm stations, electrical switches; thermostats; and door, window and drapery controls shall be placed no higher than 48 inches from the floor.

3.10.2 Electrical outlets should be located no less than 18 inches above the floor. (In areas designed specifically for the handicapped, outlets should be located 24 inches above the floor).

3.10.3 No more than 8 pounds (and preferably 5 pounds) of pressure or tension should be required to operate any switch, lever, or other essential control.

3.11 Identification and Warning

3.11.1 Symbol of Access
Buildings which are fully accessible to wheelchair users and other persons with limited mobility should display the International Symbol of Access at entrances to buildings, parking lots, toilet facilities, etc.

* 3.11.2 Room Identification for the Blind
A plaque bearing raised or notched letters or numbers should be placed on the corridor wall on the handle

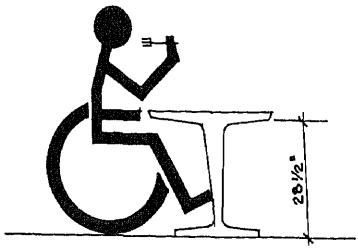
side of a doorway approximately 60 inches above the floor.

* 3.11.3 Doors leading to dangerous areas not intended for normal public use, such as mechanical equipment rooms, loading platforms, and fire escapes, should be identified by the use of knurled handles or knobs. (NOTE: "Knurling tape" may be applied to standard hardware). Similarly, floors at the head of open stairs, ramps or curbs shall be provided with abrasive strips or textured flooring material.

* 3.11.4 ANSI A 117.1 requires that warning signals shall be both visible and audible for the benefit of persons with either hearing or visual disabilities.

* 3.11.5 Hazardous areas of a temporary nature, such as construction sites, open manholes, access panels, elevator shafts, etc. must be separated on all open sides from normal pedestrian traffic by suitable barricades placed at least 96 inches from the hazard, equipped with both visible and audible warning devices.

3.12 Special Use Spaces



The following types of spaces require special attention in order to be usable by the physically handicapped:

3.12.1 Dining Areas must be directly accessible (i.e., not through kitchens) to wheelchair users.

3.12.1.1 Serving line width between tray slide and control railing should be at least 36 inches.

3.12.1.2 Outside rail height of tray slide should be no greater than 34 inches.

3.12.1.3 Access aisles between tables should be at least 66 inches wide.

ted by fascias, skirts or bracing. (NOTE: It is not desirable to design or designate a limited number of tables in a dining room for use by the handicapped, thus segregating them from the able-bodied population).

3.12.2 Spectator Spaces (auditoria, lecture halls) should have areas set aside for the physically handicapped. (Movable seats may be provided for these areas when not used by wheelchairs).

3.12.2.1 Handicapped stations should be:
a. level
b. large enough to accommodate wheelchairs
c. out of traffic ways
d. with good visibility and acoustics.

3.12.2.2 Handicapped stations should be easily accessible to exits with a level or ramped path of travel.

3.12.3 Laboratories should provide work stations for handicapped persons as determined by the program.

3.12.3.1 Each handicapped station should have a low work bench with no apron and a clear height of 28 1/2 inches to the underside of the bench. The knee space should be at least 28 inches wide.

3.12.3.2 Aisles between stations or benches must have a clear width of at least 48 inches.

3.12.4.1 All tables should have a clear height of at least 28 1/2 inches to the underside of the work surface.

3.12.4.2 Aisles between stacks should be wide enough to allow wheelchair passage.

3.12.5 Audio-Visual Control Rooms should have level or ramped access for wheelchairs. Aisles between equipment should be at least 36 inches wide.

3.12.6 Bedrooms in dormitories and similar occupancies should be designed to accommodate the physically handicapped in any facility.

3.12.6.1 Rooms serving the handicapped must be designed to allow furniture placement with at least 52 inches between major elements (Clearance between the bed and a wall surface may be 38 inches).

3.12.6.2 The clothing storage facility must be usable by individuals in wheelchairs. Hanging rods should be mounted no more than 48 inches above the floor. Partial entrance of wheelchairs into a closet is mandatory.

3.12.6.3 The matress top should be approximately 22 inches above the floor.

3.12.6.4 Windows should be easily operated from a wheelchair

3.12.6.5 Adequate ventilation must be provided, especially in bedrooms where electric wheelchairs may be recharged.

APPENDIX: WHEELCHAIR CRITERIA

The wheelchair is the basic vehicle for the non-ambulatory person. Its specifications establish the fundamental design requirements for making facilities accessible to and usable by the handicapped. Most crutch or brace-supported semi-ambulatory persons are able to maneuver within the limits prescribed for wheelchairs.

1. Wheelchair Dimensions

   The most commonly used wheelchair is the collapsible model with tubular metal frame and plastic upholstery on seat and back. The standard model of all manufacturers falls within the following ranges of dimensions:

   a. Length: 33.5 to 48 inches. Mode: 42 inches. (NOTE: does not include shoes or feet - add 6 inches).
   b. Width open: 18.5 to 32.5 inches. Mode: 26 inches (NOTE: does not include hands and arms, which extend beyond wheels when pushing).
   c. Width collapsed: 9 to 14.5 inches. Mode: 11 inches.
   d. Seat height above floor, 19.5 inches (standard).
   e. Arm height: 19.5 to 33.5 inches. Mode: 29.5 inches.
   f. Overall height: 33 to 53.5 inches. Mode: 37 inches.

2. Wheelchair Operation (based on modal dimensions listed above).

   a. Turning space required: 60 x 60 inches, or 63 x 56 inches (preferred), or 54 inch wide corridor with two open ends.
   b. Minimum aisle width for passing of two wheelchairs: 60 inches. (63 inches preferred).

3. Average Reach of an Adult Wheelchair Occupant

   a. Unilateral vertical reach: 60 inches. Range: 54 to 78 inches.
   b. Horizontal reach, table height: 30.8 inches. Range 28.5 to 33.5 inches.
   c. Bilateral horizontal reach: 64.5 inches Range: 54 to 71 inches.
   d. Diagonal reach to object on wall: 48 inches above floor.

   It should be noted that the above are averages for an adult using a standard wheelchair. The very small adult, the child, the unusually weak individual, the user of a wheelchair with detachable arms or with a leg extended forward, these would fall outside the above ranges and must be considered.

NATIONAL PARK SERVICE
DENVER SERVICE CENTER
7200 W. Alameda
Denver, Colorado 80226

TRAILS FOR THE BLIND AND HANDICAPPED
General Information

When the sense of sight is lost, we grasp for contact with the outside world through our other senses. In the United States today, there are thousands of blind, near blind, or sight-impaired persons that must rely on senses of touch, hearing, and smell in a world that has been designed for vision.

When designing a nature trail for the blind one should solicit the help of a school for the blind, and a blind person. To quote Donna Pastore in her speech at the First National Symposium on Trails: When designing a trail to accommodate the needs of the blind and physically handicapped, certain factors must be taken into consideration. I think one of the primary concerns of those planning a trail should be its location. A trail may possess numerous facilities for a blind or physically handicapped person to walk freely and discover all the wonders and contrasts of nature, but unless it is located in an accessible spot, its value is greatly limited.

In most instances a blind person much prefers relying upon his own means of mobility and public transportation rather than depending upon a sighted friend to take him for a walk in the country. If I were selecting a trail site, I think I would choose a small section of a park in an urban area, provided that it would be located far enough away from city noises which would interfere with the peaceful atmosphere of the country.

When planning a trail for the blind and physically handicapped, a simple layout is a basic necessity. The trail should be similar to a real woodland with winding paths and undulating terrain, but its paths should not incline too steeply. This would not easily accommodate wheelchairs, and might prove hazardous to other visitors, particularly the elderly and infirm. The forest floor should be covered with dry leaves, not wood chips. Because of its educational features, a trail would be the perfect place for teachers to combine a field trip with a natural history lesson. If a child were to fall or decide to rummage through the material on the forest floor, splinters would invariably result.

The time element is another important factor in developing a trail. The purpose of the trail, in my opinion, is to provide each visitor with a new meaningful experience, a true lesson in the ways and beauty of nature. For those who are not accustomed to nature hikes or walks in the woods, too long a trail would be only defeating its purpose. Its visitors would become tired, sluggish, and probably apatheic to their beautiful surroundings. Walking along the trail would be a chore, not a pleasant experience, and their disinterest would culminate in their desire never to return to the trail again.

In summary, then, a trail designed for the blind and physically handicapped should try to uphold the same objective as that maintained by other trails, to develop a growing knowledge and awareness of mankind's natural environment. (Donna is a Mathematics Braille Specialist, Library of Congress. She is blind).

A guide should not be needed.

Navigational or directional aids are important in order that a person not have a feeling of being lost. Braille signs should explain possible natural sounds, odors and objects a person may encounter while on the trail. Some navigational aids other than the guide rope that may be used are: railing, log curb, rock curb, kick rail six to twelve inches off the ground, boards between guide logs flush with trail for use with cone, inverted "U" construction of boards which make hollow sound when tapped with a cane. Guide ropes are preferred; they allow the person to walk at a lesisurely rate of speed. A person will know by touch when he reaches an information station. The sense of sound can be used to detect the wind in the trees, the snap of a twig under foot, the singing of birds. Freedom allows one to become totally involved in his environment. This way a person can better appreciate the beauty of nature.

could also provide a family or a group an opportunity to hike together. Such a trail would offer a learning experience for everyone.

When planning trails for the handicapped, the Department of the Interior lists the following limitations that should be considered:

1. Limitation in walking–

   a. Difficulty in walking distances.

   b. Difficulty in walking on non-level and non-smooth surfaces.

   c. Inability to walk but ability to propel oneself in a wheelchair on level and certain graded surfaces.

   d. Inability to propel a wheelchair because of extensive disability, hence must be accompanied by an attendant.

2. Limitations in seeing or hearing or both–

   a. Difficulty in seeing or hearing warnings and safety hazards because of limited vision or audition due to disability or age.

   b. Inability to see or hear warnings and safety hazards because of extensive disability.

3. Limitations in the use of hands and arms–

   a. Difficulty in opening gates or doors, manipulating equipment, etc., because of muscle and joint weakness, or because of the necessity to manipulate crutches, a cane or a wheelchair.

   b. Inability to open gates or doors, etc., because of extensive disability in the muscles and joints of the hands and arms.

4. Limitations in understanding information, directions and warnings–

   a. Difficulty in reading printed signs because of partial sight or intellectual impairment.

   b. Inability to read printed signs because of blindness or severe intellectual impairment.

There are over 19 million physically handicapped people in the United States; many restricted to wheelchairs or crutches. Many others suffer from lack of strength. Also, the number of elderly citizens increases each year. Today, there are about 20 million people over 65 years of age. Let's provide an opportunity for everyone to enjoy nature whenever possible.

CONSTRUCTION OF SPECIAL TRAILS FOR THE BLIND AND HANDICAPPED

- Parking lot should be hard surfaced.
- The parking lot and trail should be designed to accommodate wheelchairs, crutches, the blind, etc.
- The trail should not be larger than 1,500 feet and 6 feet wide. It should be hard surfaced with an easy gradient.
- The trail should be circular and designed for use by everyone.

APPROXIMATE COST

- 6 feet wide, 1,500 feet long, hard surfaced. Cleaning, grading, excavation, gravel or stone base, drainage facilities and asphaltic material $7,000.00

ACCOMMODATIONS FOR THE PHYSICALLY HANDICAPPED

1. PURPOSE

This standard establishes policy for the design, construction, and alteration of certain VA buildings and facilities so that physically handicapped persons will have ready access to, and use of, such buildings and facilities.

2. FEDERAL LAW AND REGULATIONS

The design, construction, and alteration of VA buildings and facilities shall comply with the following applicable Federal law and regulations:

a. Public Law 90-480, approved August 12, 1968, entitled "An Act to insure that certain buildings financed with Federal funds are so designed and constructed as to be accessible to the physically handicapped"; (42 U.S.C. 4151), as amended.

b. Federal Property Management Regulations, Chapter 101, Subpart 101-17.7, entitled "Accommodations for the Physically Handicapped"; (41 CFR 101-17.7).

3. VA SUPPLEMENTARY STANDARDS

The applicable Federal Property Management Regulations (41 CFR 101-17.7) require conformance to the minimum standards contained in the "American Standard Specifications for Making Buildings and Facilities Accessible to, and Usable by, the Physically Handicapped, Number A117.1 - 1961", approved by the American National Standards Institute, Inc. In addition to the basic minimum standards in ANSI A117.1 - 1961, the VA requires conformance to the supplementary standards prescribed in the following paragraphs of this VA construction standard. These supplementary VA standards are not intended to be a substitute for all the basic standards in ANSI A117.1 - 1961. To forestall misinterpretations and to avoid potential conflicts between the two standards, the unsupplemented basic standards in ANSI A117.1 - 1961 are neither repeated nor paraphrased in this VA construction standard. However, this VA construction standard shall govern wherever it deviates from ANSI A117.1 - 1961.

4. SITE DEVELOPMENT

a. **Walks.** Walks shall be at least 72 inches wide and shall have a gradient not greater than 3 percent. A ramp shall be substituted for any walk where the gradient of the walk would otherwise exceed 3 percent. The ramps shall comply with the requirements prescribed in paragraph 5a of this VA construction standard. Walks that have gradients of from 2 to 3 percent shall be provided with level platforms at 200-foot intervals and at intersections with other walks. A walk shall have a level platform that is at least 6 feet by 6 feet, at the entry to a building, or where the direction of traffic-flow changes. These platforms shall extend at least 18 inches beyond each side of the doorway for single leaf doors and 12" for double leaf doors. Walks and platforms shall have nonslip surfaces. Warning lines of a contrasting color shall be provided across the full width of a walk at its intersection with a vehicular traffic lane. The warning lines shall be perpendicular to the vehicular traffic lane and shall extend not less than 3 feet from the vehicular traffic lane. In order to be perceptible to the touch when swept by the cane of a blind person, the warning lines shall be composed of durable nonslip abrasive strips that project approximately 1/16-inch above the finished surface of the walk. The strips shall be 3 inches wide; a 3-inch clear space shall be left between them.

b. **Parking Lots.** Spaces that are accessible and proximate to the main entrance and to the outpatient entrance to each building or facility shall be set aside and identified for use by individuals with physical disabilities. When placed between two conventional diagonal or head-on parking spaces, single parking spaces for individuals with physical disabilities shall be 13 feet 6 inches wide. If multiple parking spaces are provided for individuals with physical disabilities, each of the parking spaces shall be not less than 9 feet wide; in addition, a

: provided between the adjacent parking spaces and also on the outside of
;) shall be provided between the parking spaces used by individuals with
:s to those parking spaces. The curb ramps shall comply with the detailed s

. Curb ramps shall be provided at all intersections of roads and walks.
feet wide; they shall not have a slope greater than 8 percent, and prefer
vertical angle between the surface of a curb ramp and the surface of a road
legrees; the transition between the two surfaces shall be smooth. Warning li
ie preceding paragraph 4a shall be provided on a curb ramp at its intersectio
amps shall have nonslip surfaces.

ny walks or floors shall be ramped if the slope exceeds 3 percent. Ra
percent, and preferably not greater than 5 percent. The ramps shall have
ll have a clearance of not less than 1-½ inches between the back of the
surface behind it. Ramps shall not be less than 4 feet wide clear betwe
ides. The curbs shall not be less than 4 inches high and 4 inches wid
an the full width of the ramp and not less than 5 feet long.
platforms and ramps shall be provided with protective weather barriers to shield them against h
conditions resulting from inclement weather. Ramps and level platforms in ramps shall have nonslip surfa

b. **Entrances.** Entrances shall be level, within the requirements of this standard. Entrances to all o
buildings and facilities shall be usable by individuals with physical disabilities. Routes to the entrances
accessible to, and usable by, the handicapped shall be marked by directional signs placed at the parkin
main entrances, and along the way to the accessible entrances; the accessible entrances themselves shal
marked by identification signs. The signs shall incorporate the *International Symbol of Accessibility*
Handicapped, as prescribed in paragraph 5j of this VA construction standard.

c. **Doors and Doorways.** Single-leaf doors, and at least one leaf of double-leaf doors, shall hav
opening of no less than 34 inches and shall be operable by a single effort. "Operable by a single effor
that they can be opened the full width of the doorway by a single push or pull of not more than 8 p
pressure, and preferably not more than 5 pounds. Thresholds shall not project above the finished fl
centerline of door handles shall be not more than 36 inches above the floor. Lever type handles are
instead of door knobs. At full glass doors, warning lines of a contrasting color shall be provided on
across the full width of the doorway. The warning lines shall be perpendicular to the door and shall ex
less than 3 feet on both sides of the door. In order to be perceptible to the touch when swept by the
blind person, the warning lines shall be composed of durable nonslip abrasive strips that project appro
1/16-inch above the finished surface of the floor. The strips shall be 3 inches wide; a 3-inch clear spac
left between them.

d. **Stairs.** Handrails shall be provided on both sides of stairs. The handrails shall be designed so t
clothing cannot catch over their ends. Treads shall have nonslip surfaces and shall have nosings of a
contrast to the general color of the stairs. The contrasting color shall extend 1 inch down the riser ar
deep along the full length of the tread. At the top and bottom of stairs, warning lines of a contrasting c
be provided on the floor across the full width of the stairs. The warning lines shall be perpendicular to
and shall extend not less than 3 feet from the stairs. In order to be perceptible to the touch when swe
cane of a blind person, the warning lines shall be composed of durable nonslip abrasive strips tha
approximately 1/16-inch above the finished surface of the floor. The strips shall be 3 inches wide; a clear
3 inches shall be left between them.

e. **Toilet Rooms.** Toilet rooms that are made accessible to, and usable by, the physically handicapped shall be clearly marked by signs incorporating the *International Symbol of Accessibility for the Handicapped*, as prescribed in paragraph 5j of this VA construction standard. The toilet rooms of this type that are provided for visitors shall preferably be located on the level at which the visitors enter the building; the toilet rooms that are provided for employees shall be located adjacent to main locker rooms. Every toilet room of this type shall be provided with the following:

(1) **Water Closet Compartment.** At least one water closet compartment shall: (a) be not less than 5 feet 6 inches wide and not less than 6 feet deep; (b) have a door that is 34 inches wide which swings out and that is not located directly in front of the water closet; (c) have a grab rail on one side, 30 inches high, 1 1/2 inches in outside diameter with 1 1/2 inches clearance between rail and wall; and (d) have one wall mounted water closet with its centerline located 18 inches from the side wall to which the grab rail is fastened, and placed with the seat 15 inches above the finished floor.

EXCEPTION. As an alternative to the immediately preceding standards, the water closet compartment may: (a) be not less than 3 feet 6 inches wide and not less than 6 feet 6 inches deep; (b) have a door that is 34 inches wide which swings out; (c) have grab rails on each side, 30 inches high, 1 1/2 inches in outside diameter, with 1 1/2 inches clearance between rail and wall; and (d) have one wall mounted water closet located on the centerline of the rear wall of the compartment, and placed with the seat 20 inches above the finished floor.

(2) **Lavatories.** One of the lavatories shall be either a wheelchair type, VA Equipment Guide List Symbol No. P-66WCL and have a tilted mirror above as shown on VA Architectural Standard Detail No. 15; or it shall be a vanity type as shown on VA Architectural Standard Detail No. 53. Either single lever (not "Push-Pull" type) or wrist blade water controls shall be provided for wheelchair lavatories. A paper towel dispenser and a duplex electrical receptacle shall be provided within easy reach of a handicapped individual seated in a wheelchair in front of the lavatory. The dispenser shall be surface mounted, with its bottom no higher than 40 inches above the finished floor. The towel dispenser shall be designed for multifold interlocking paper towels.

(3) **Urinals.** Urinals shall have a manual flushing handle mounted not more than 40 inches above the finished floor. Stall urinals extending to the floor are acceptable for use by the handicapped and may be provided under this standard. Wherever wall mounted urinals are provided for use by patients, staff, and/or the general public, one of the urinals shall be mounted with the lip of the basin not more than 15 inches above the finished floor, so as to be usable by the handicapped.

(4) **Entrance Doors.** The toilet room entrance doors shall be easy opening, 3 feet wide, and hinged to swing into the room. Where the plan arrangement would otherwise permit a direct view of the toilet room while the entrance door is open, a suitable screen partition shall be provided not less than 4 feet away from the entrance door, as shown on VA Architectural Standard Detail No. 12A.

f. **Water Fountains.** Water fountains and water coolers provided for the handicapped shall be set into alcoves and shall be wall mounted with the rim at 34 inches above the finished floor and provide a minimum clearance of 27 inches under the fountain, all as shown on VA Architectural Standard Detail No. 4C.

g. **Public Telephones.** At least one public telephone for handicapped individuals shall be provided on each floor. These telephones shall have amplifiers on the receivers, push button controls, and cords not less than 3 feet long. The telephone cabinets shall be as shown on VA Architectural Standard Detail No. 56.

h. **Elevators.** These requirements apply to all elevators except mortuary and freight elevators. Call buttons in elevator lobbies shall be centered 3 feet 4 inches above the finished floor. Signals audible in elevator lobbies shall emit a sound of higher pitch for upward bound arriving cars; lower pitch for downward bound arriving cars. An automatic elevator shall have: (1) slow-acting doors, meaning doors requiring 7 foot-pounds or less of kinetic energy to close, resulting in an average closing speed of one foot per second; (2) doors with mechanical safety

station or in the side wall of the car adjacent to the entrance strike jamb; (6) the auxiliary call buttons in the car centered at 3 feet, and extended not more than 3 feet 6 inches, above the floor of the car (where an auxiliary car operating panel is not feasible, the main car operating panel shall meet these height requirements); (7) double handrails on three sides of the car located at heights of 32 inches and 42 inches respectively above the floor of the car; (8) a car that is not less than 5 feet 8 inches wide and 5 feet deep; (9) an emergency intercom station, without dial, located not more than 40 inches above the floor of the car; (10) call and operating buttons illuminated and projecting from the panel board; and, (11) push-to-stop emergency buttons raised from the panel board.

i. **Utility Outlets, Receptacles, and Controls.** The centerlines of utility outlets, receptacles, switches, and controls for light, heat (exclusive of thermostats), ventilation, windows, draperies, plumbing and all similar controls of frequent or essential use, shall be located where they will be accessible to the handicapped and shall be mounted within a range of 18 to 40 inches above the finished floor. The centerlines of fire alarm boxes shall be mounted 48 inches above the finished floor.

j. **Identification.** The *International Symbol of Accessibility for the Handicapped* shall be used to clearly identify facilities and areas that are designed for full access and use by all handicapped individuals. The Symbol is illustrated on VA Architectural Standard Details No. 45A and 45B.

k. **Cafeterias and Retail Stores.** Food serving lanes and aisles shall not be less than 36 inches wide, and preferably 48 inches wide. Cutlery and display racks shall be visible to, and within easy reach of, an individual seated in a wheelchair; the racks shall not be higher than 54 inches above the finished floor. Tray lines should be continuous through the serving and dispensing areas to the cashier's station.

l. **Vestibules.** Where a vestibule is considered necessary, its depth shall be not less than 6 feet 6 inches and both doors shall swing in the same direction.

m. **Carpets.** Carpets in public areas shall be the contract type designed for heavy traffic. The carpeting shall have a tight weave and a low pile, preferably a tight dense loop pile and not a plush or cut pile. Carpets installed without underlayments are preferred by wheelchair users.

n. **Tables.** The vertical clear space between the bottom surface of a table and the finished floor shall not be less than 30 inches; nor shall the clear space be obstructed by horizontal bracing, skirts, fascias, and table bases. Pedestal base or cantilevered type tables are preferred.

o. **Ash Trays.** The lips of wall mounted ash trays shall not be higher than 36 inches above the finished floor.

6. **RESCISSION**

VA Construction Standard CD-28 "Facilities for the Handicapped (Other Than Patients)", dated March 24, 1966, is hereby rescinded.

V. P. MILLER
Assistant Administrator
for Construction

Distribution: RPC: 0830
FD

a survey of state laws to remove barriers

August 1973

THE PRESIDENT'S COMMITTEE ON EMPLOYMENT OF THE HANDICAPPED

Washington, D.C. 20210

The purpose of this publication is to highlight the prominent features of each state's architectural barrier law. Since we first published this information in 1971 many states have amended existing laws or adopted new ones. As a result, a new survey was undertaken and the data collected used as a basis for this updated edition. If more complete information is required on a particular law, we recommend that you write to t Governor's Committee on Employment of the Handicapped of the state involved.

COMMITTEE ON BARRIER FREE DESIGN

STATE	*LEGISLATION & DATE EFFECTIVE*	*ADOPTS ANSI* STANDARDS*	*SANCTIONS FOR NONCOMPLIANCE*	*INCLUDES PUBLICLY FUNDED BUILDINGS*	*INCLUDES PUBLICLY USED, PRIVATELY OWNED BUIDINGS*
Alabama	Leg. Act: #224 8/9/65	Yes	No	Yes	No
Alaska	Leg. Act: #303 Amended by Senate Chapter #119 1/1/67	Yes		Yes	No
Arizona	Leg. Act: #113 Chapter #65 1/1/68 Leg. Act: #2045 July, 1973	Yes		Yes	Yes
Arkansas	Leg. Act: #122 H.B. #257 2/21/67	Yes	No	Yes	No
California	Leg. Act: Assembly Bill #2238 A.B. 710 6/7/71	Yes	No	Yes	Yes
Colorado	Leg. Act: S.B. #47 5/27/65	Yes	No	Yes	No

*"Standards of A.N.S.I." Shall refer to the American National Standards Institute Standards for Making Buildings and Facilities Accessible to, and Usable by, the Physically Handicapped. (ANSI 117.1-1971.)

EXPLICITLY COVERS REMODELING	LEASED BUILDINGS	RESPONSIBLE FOR ENFORCEMENT	INSPECTION OF NEW BUILDINGS	REMARKS
No	No	Where State school funds are utilized—by the State Board of Education. Where other State funds are utilized—by the chief of technical staff of the State Building Commission. Where funds of counties, municipalities or other political subdivisions are utilized—by the governing bodies thereof.	Yes	
		Department of Public Works.		Waiver Clause: "The regulations of the department shall conform as far as it is feasible" to the Standards of A.N.S.I."
No	No	For constructing buildings or facilities for a State university or college—by the Arizona Board of Regents. For a junior college—by the governing body of the junior college district. For a public common school or high school district—by the governing body of the common or high school district. Where other State funds are utilized—by the State agency responsible for planning and supervising the construction. Where funds of other political subdivisions are utilized for construction—by the governing bodies thereof.		
No	No	By the Department of Health.	Yes	
Yes	Yes	Where State funds are utilized—by the Director of the Dept. of General Services. Where funds of other political subdivisions are utilized—by the governing bodies thereof; privately funded by the building Dept. of city or county where built.	Yes Gov't. No Private	Bill also includes sidewalks, curbs, and related facilities.
No	No	Where State funds are utilized—by the division of public works. Where funds of other political subdivisions are utilized—by the governing bodies thereof.	No	

STATE	LEGISLATION & DATE EFFECTIVE	ADOPTS ANSI* STANDARDS	SANCTIONS FOR NONCOMPLIANCE	INCLUDES PUBLICLY FUNDED BUILDINGS	INCLUDES USED, PRIV OWNED BU
Connecticut	Leg. Act: H.B. #3863 Public Act #216 6/23/65 H.B. #8518 1/1/73	(In part only.)		Yes	Yes
Delaware	S.B. 264 6/30/73	No; criteria contained in law.	No	Yes	No
District of Columbia	Executive Order #65-413 3/30/65	No		Yes	No
Florida	Leg. Act: #225 (1961) Amended 7/1/65 Amended 7/1/72	Yes		Yes	No
Georgia	Leg. Act: SB/412/CA/1 4/3/72	No		Yes	No
Hawaii	Leg. Act: #260 H.B. #158 7/16/69	Yes		Yes	No

EXPLICITLY COVERS REMODELING	LEASED BUILDINGS	RESPONSIBLE FOR ENFORCEMENT	INSPECTION OF NEW BUILDINGS	REMARKS
Yes		Dept. of Public Works.		Waiver Clause: The public works commissioner can "set aside or modify any particular standard or specification when it is determined that it is impractical and would work an unusual hardship or unreasonably complicate the construction, alteration or repair in question."
Yes	No	Secretary of the Department of Administrative Services.	Yes	Waiver Clause. "For good and sufficient reason stated in writing concern—severe economic hardship to the State or to the political subdivision involved." Waivers judged by special review committee
		Department of Buildings and Grounds		Waiver Clause: "Design modifications to accommodate handicapped persons shall be made to the extent feasible without adding significantly to the cost of construction."
Yes	Yes	By the "contracting authority" in question.		Waiver Clause: "Insofar as financially reasonable in the opinion of said contracting authority, such facilities shall conform with the (standards of A.N.S.I.)
Yes		State Fire Marshall.		
No, although enforcing agency has policy relative to remodeling.	No	Dept. of Accounting and General Services.	Yes	

STATE	LEGISLATION & DATE EFFECTIVE	ADOPTS ANSI* STANDARDS	SANCTIONS FOR NONCOMPLIANCE	INCLUDES PUBLICLY FUNDED BUILDINGS	INCLUDES PU USED, PRIVAT OWNED BUIDI
Idaho	Leg. Act: H.B. #21 Chapter #5 7/1/67	Yes		Yes	No
Illinois	Leg. Act: H.B. #2416 1/1/68	Yes	Yes	Yes	Yes
Indiana	Leg. Act: Chapter #49 10/24/69	Yes	No	Yes	No
Iowa	Leg. Act: Chapter #104A Code of Iowa Sen. File #352 4/22/65	Yes		Yes	No
Kansas	Leg. Act: S.B. #517 1/1/69	Yes		Yes	No
Kentucky	No Law				
Louisiana	Leg. Act: #204 H.B. #100 6/28/66	Yes	Yes	Yes	No
Maine	Leg. Act: H.P. #1114- L.D. #1583 Creating Part #7, Chapter #331 6/6/67 Also S.P. #100- L.D. #310 (3/13/69) L.D. #657 (4/2/73)	Yes	Yes	Yes	No

Leg. & Date Effective	Application of Act	Compliance Adopts ANSI St.*	Remod.	Leased Bldgs.	Enforcements: State Bldg.	Enforcements: School Bldgs.	Enforcements: Local Public Bldgs.	New Bldg.	Remarks
DELAWARE									
Senate Bill #264 6/30/73	All publicly funded buildings	Partially criteria contained in law	✓	X	Secretary of Dept. of Administrative Services			✓	Waiver Clause: "For good and sufficient reason stated in writing concern-severe economic hardship to the State or to the political subdivision involved." Waivers judged by special review committee
DISTRICT OF COLUMBIA									
Executive order #65-413 3/30/65	All publicly funded buildings	No	X	X	Department of Buildings and Grounds			X	Waiver Clause: "Design modifications to accommodate handicapped persons shall be made to the extent feasible without adding significantly to the cost of construction."
FLORIDA									
Leg. Act #225(19d) amended 7/1/65 amended 7/1/72	All publicly funded buildings	Yes	✓	✓	"Contracting Authority" in question			X	Waiver Clause: "Insofar as financially reasonable in the opinion of said contracting authority, such facilities shall conform with the (standards of A.N.S.I.)
GEORGIA									
Leg. Act Senate Bill #412-CA-1 4/3/72	Public Funded Bldg.	No	✓	X	State Fire Marshall			X	
HAWAII									
Leg. Act #260 House Bill #158 7/16/69	Publicly Funded Bldg.	Yes	No but enforcement ag. has rem. policy	X	Dept. of Accounting and General Services			✓	—
IDAHO									
Leg. Act House Bill #21 Chapter #5 7/1/67	All public bldg. constr. by state & pol. sub. funds	Yes	X	X	Contracting officer or authority of the state or its pol. sub-div.			X	Waiver Clause: Facilities features for the physically handicapped shall be provided "to the extent deemed feasible by the contracting officer or authority of the State or sa? political subdivisions. Insofar as is feasible in the opinion of said contracting officer or authority, such facilities shall conform with the (standards of A.N.S.I.")
ILLINOIS									
Leg. Act House Bill #2416 1/1/68	Publicly owned bldg.-publicly used, privately owned bldg.	Yes	✓	X	Dept. of General Services			X	Waiver Clause: "This standard shall be applied to the extent deemed feasible, in cases of remodeling."
INDIANA									
Leg. Act Chap. #49 10/24/69	Publicly owned bldg.	Yes	X	X	Administrative Building Council			✓	
IOWA									
Leg. Act Chap. #104 Code of Iowa Senate File #352	All public funded bldg.—emergency & temporary conditions also	Yes	X	X	State Building Code Commissioner			✓	

EXPLICITLY COVERS REMODELING	*LEASED BUILDINGS*	*RESPONSIBLE FOR ENFORCEMENT*	*INSPECTION OF NEW BUILDINGS*	*REMARKS*
		The contracting officer or authority of the State or its political subdivisions.		Waiver Clause: Facilities and features for the physically handicapped shall be provided "to the extent deemed feasible by the contracting officer or authority of the State or said political subdivisions. Insofar as is feasible in the opinion of said contracting officer or authority, such facilities shall conform with the (standards of A.N.S.I.")
Yes	Yes	Department of General Services.	No	Waiver Clause: "This standard shall be applied, to the extent deemed feasible, in cases of remodeling."
No	No	Administrative Building Council	Yes	
		State Building Code Commissioner.	Yes	
Yes (if remodeling is in excess of 25% of gross area.)		For all school building construction and construction where State funds are utilized—by the architectural division of the State department of Administration. Where funds of counties, municipalities or other political subdivisions are utilized—by the governing bodies thereof.		
No	No	State Fire Marshall	No	
Yes (When reconstruction costs exceed $100,000.)	No	Where school funds are utilized—by the Commissioner of Education. Where State funds are utilized—by the Director of Public Improvements. Where county or municipal funds are utilized—by the governing bodies thereof.	Yes	

STATE	LEGISLATION & DATE EFFECTIVE	ADOPTS ANSI* STANDARDS	SANCTIONS FOR NONCOMPLIANCE	INCLUDES PUBLICLY FUNDED BUILDINGS	INCLUDES PUB USED, PRIVATI OWNED BUIDI
Maryland	Leg. Act: S.B. #404 Added new Sec #51 to Article #78a 7/1/68	Yes	No	Yes	No
Massachusetts	Leg. Act: S.B. #1427 Chapter #22 As amended by Chapter #724. Also Leg. Act: #3537 1/21/68	Yes		Yes	No
Michigan	Leg. Act: #1 Public Acts 1966 7/1/66 and Leg. Act: #243 Public Acts of 1970—amending above 7/1/71	Yes	Yes	Yes	Yes
Minnesota	State Building Code 6/1/71	Yes	Yes	Yes	Yes
Mississippi	Leg. Act: S.B. #2131 7/1/72	No	Yes	Yes	No
Missouri	Leg. Act: H.B. #311 1967	No	No	Yes	No
Montana					

EXPLICITLY COVERS REMODELING	LEASED BUILDINGS	RESPONSIBLE FOR ENFORCEMENT	INSPECTION OF NEW BUILDINGS	REMARKS
No		Where State school funds are utilized—by the State Department of Education. Where other State funds are utilized or where construction is upon state-owned land—by the General Services Administration. Where the funds of counties or other political subdivisions are utilized—by the governing bodies thereof.	Yes	Possible Waiver clauses: This act contains provision stating that barrier free public buildings and facilities should be suitably marked by an "accessible to the handicapped" symbol. Act also applies to publicly funded-publicly used transportation accommodations which are engaged in mass transportation.
Yes		Where State school funds are utilized—by the respective governing body. Where State funds are utilized—by the superintendent of public buildings. Where funds of counties, municipalities or other political subdivisions are utilized—by the governing bodies thereof.		
Yes	No	Where State school funds are utilized—by the Department of Education. The State Building Division will enforce rules for all other buildings through building inspectors and others.	No	
Yes		State Building Code Inspector.	Yes	
Yes	No	State Board of Health.	No	Waiver Clause: "Except where such compliance is impractical in the opinion of the State Board of Health."
No	No	Where State funds are utilized, either the State Dept. of Education or the division of planning and construction. Where funds of counties, municipalities or other political subdivisions are utilized—the governing bodies thereof.	No	
No	No	Where State school funds are utilized—the superintendent of public instruction. Where State funds are utilized—by the State controller. Where funds of counties, municipal-	No	

STATE	LEGISLATION & DATE EFFECTIVE	ADOPTS ANSI* STANDARDS	SANCTIONS FOR NONCOMPLIANCE	INCLUDES PUBLICLY FUNDED BUILDINGS	INCLUDES PUB USED, PRIVATI OWNED BUILDI
Nebraska	Leg. Act: #584 11/16/65	Yes		Yes	No
Nevada	Leg. Act: S.B. #446 3/13/73	Yes	No	Yes	No
New Hampshire	Leg. Act: H.B. #59 7/1/65	Yes	No	Yes	No
New Jersey	Leg. Act: Assemble Bill #1192 A.B. #355 1972	Yes		Yes	No
New Mexico	Leg. Act: H.B. #303 Chapter #194 3/25/65	Yes	Yes	Yes	No
New York	Leg. Act: Chapter #656 9/1/72	Yes	Yes	Yes	Yes
North Carolina	State Building Code 3/13/73	No	Yes	Yes	Yes

EXPLICITLY COVERS REMODELING	LEASED BUILDINGS	RESPONSIBLE FOR ENFORCEMENT	INSPECTION OF NEW BUILDINGS	REMARKS
		Where State school funds are utilized—by the Commissioner of Education. Where State funds are utilized—by the Commissioner of Labor. Where funds of counties, municipalities or other political subdivisions are utilized—by the governing bodies thereof.		
No	No	"All plans and specifications for the constructions of public buildings and facilities by the state or by a political subdivision, district, authority, board or public corporation or entity of the state shall provide facilities and features for the physically handicapped to the extent deemed feasible by the contracting officer or authority."		
No	No	Where State school funds are utilized—by State board of education. Where other State funds are utilized—Department of Public Works. Where funds of counties, municipalities or other political subdivisions are utilized—by the governing bodies thereof. Contracting authority.		
Yes	No	State Construction Industry's Board.	Yes	Waiver Clause: Any particular standard may be waived if the governing authority responsible for the construction and the board find the requirements: "impracticable."
Yes	Yes	The official governing body or board having design approval authority.	Yes	516 municipalities subscribe to the NY State Building Code which provides for accessible construction.
Yes	Yes	NC Dept. of Insurance.	Yes	

STATE	LEGISLATION & DATE EFFECTIVE	ADOPTS ANSI* STANDARDS	SANCTIONS FOR NONCOMPLIANCE	INCLUDES PUBLICLY FUNDED BUILDINGS	INCLU USED, OWNE
North Dakota	Leg. Act: H.B. #1129 7/1/73	Yes	No	Yes	No
Ohio	Leg. Act: #124 Gen. Assembly Reg. Sess. 1965-6 1/1/66	No	No	Yes	No

G	LEASED BUILDINGS	RESPONSIBLE FOR ENFORCEMENT	INSPECTION OF NEW BUILDINGS	REMARKS
	No	State Construction Superintendent	Yes	Waiver Clause: In cases of practical difficulty, unnecessary hardship or extreme differences the State construction superintendent may grant exceptions from the literal requirements of the standards provided by this act or permit the use of other methods or materials, but only when it is clearly evident that reasonably equivalent facilitation and protection are thereby secured.
	No	Board of Building Standards		Waiver Clause: "The Board of Building Standards shall adopt standards, rules and regulations to facilitate the *reasonable* access and use by all handicapped persons of all public buildings and the facilities thereof erected after Jan. 1, 1966. The Board of Building Standards adopted in 1966 the A.N.S.I. standards pertaining to publicly funded buildings. Waiver Clause is in Board of Building Standards: "The chief enforcement official may permit a variance from the provisions . . . where the cost of compliance would be substantially disproportionate to the total cost and anticipated use of the structure.

STATE	LEGISLATION & DATE EFFECTIVE	ADOPTS ANSI* STANDARDS	SANCTIONS FOR NONCOMPLIANCE	INCLUDES PUBLICLY FUNDED BUILDINGS	INCLUDES PUBLIC USED, PRIVATELY OWNED BUIDINGS
Oklahoma	Leg. Act: #956 1/2/66	Yes	No	Yes	No
Oregon	Leg. Act: H.B. #1074 Unknown	Yes	Yes	Yes	No
Pennsylvania	Leg. Act: #348 Act of Gen. Assembly #235 9/1/65	Yes	Yes	Yes	No
Rhode Island	Leg. Act: Jan. Session 1964 1/19/64	Yes	No	Yes	No
South Carolina	Leg. Act: H.B. #1438 4/27/73 R 308 and R 293, S13 5/7/63		Yes	Yes	No
South Dakota	Leg. Act: S.B. #162 Chapter #312 40th Session	Yes		Yes	No

ITLY S ELING	LEASED BUILDINGS	RESPONSIBLE FOR ENFORCEMENT	INSPECTION OF NEW BUILDINGS	REMARKS
	No	Board of Public Affairs, but where funds of counties, or other political subdivisions are involved, it shall be the governing body thereof.		Waiver Clause: Facilities shall be provided "For the handicapped to the extent deemed feasible by the contracting authority. Insofar as feasibly and financially reasonable, in the opinion of the contracting authority such facilities shall conform with the (Standards of A.N.S.I.")
	Yes	State Fire Marshall.	Yes	
	No	Dept. of Labor and Industry.	Yes	
	No	None	No	
		Where State school funds are utilized—State Educational Finance Comm. Where State funds are utilized—by the Chief of the engineering staff of the State Budget and Control Board. Where funds of counties, municipalities or other political subdivisions are utilized—by the governing bodies thereof.		Amendment to law includes tax deduction for renovation of building or facility intended to be used and is actually used by the general public. The minimum renovation required shall include one or more of the following: ground level or ramped entrance, free movement between public use areas, and washroom and toilet facilities accessible to and usable by physically handicapped persons.
		State Engineer.	Yes	Effective 7/1/71, the international symbol of access must be displayed at the entrance of public buildings and facilities in SD if such structures have provisions to accom-

STATE	LEGISLATION & DATE EFFECTIVE	ADOPTS ANSI* STANDARDS	SANCTIONS FOR NONCOMPLIANCE	INCLUDES PUBLICLY FUNDED BUILDINGS	INCLUDES PUBLICLY USED, PRIVATELY OWNED BUIDINGS
Tennessee	Leg. Act: S.B. #641 Chapter #484 2/25/70	Yes	No	Yes	No
Texas	Leg. Act: S.B. #111 Chapter #324 1/1/70	Yes	Yes	Yes (also applies to Federally funded buildings)	No
Utah	Leg. Act: 1969	Yes	No	Yes	Yes
Vermont	Leg. Act: H. #49 7/1/67	Yes	No	Yes	No
Virginia	Leg. Act: Chapter #539 of Acts of Assembly, 1970 6/26/70	Yes	No	Yes	No

TLY S ELING	LEASED BUILDINGS	RESPONSIBLE FOR ENFORCEMENT	INSPECTION OF NEW BUILDINGS	REMARKS
	Yes	The governmental or political department, agency, unit, or subdivision of the State, which under the law has the primary responsibility for the design of the public building.	Yes	Waiver Clause: "The minimum specifications shall be complied with . . . unless the Responsible Authority (in his respective area) shall determine that compliance is reasonably impracticable from either an architectural or a financial standpoint, in which event such compliance as is reasonably practicable shall be effected."
	Yes	State Building Commission with legal support from the District Court. The governing bodies of state-supported institutions of higher education are responsible for enforcement within their jurisidction.	Yes	
	No	Where State school funds are utilized—by the State Board of Education. Where State funds are utilized—by the Utah State Building Board. Where funds of counties, municipalities or other political subdivisions are utilized—by the governing bodies thereof.	Yes	
	No	Where school funds are utilized—by the State Board of Education. Where other public funds are utilized—by the department of public safety.	No	Waiver Clause: "The building construction specifications at the time of construction shall, as far as practicable, be equal to ANSI 117.1.
	No	Director of the Division Office of Engineering and Buildings.	No	

STATE	LEGISLATION & DATE EFFECTIVE	ADOPTS ANSI* STANDARDS	SANCTIONS FOR NONCOMPLIANCE	INCLUDES PUBLICLY FUNDED BUILDINGS	INCLUDES PU USED, PRIVATI OWNED BUIDI
Washington	Leg. Act: H.B. #841 1971	Yes	No	No	Yes
	Leg. Act: H.B. #438 3/15/67	Yes		Yes	No
West Virginia	Leg. Act: H.B. #676 7/1/69	No		Yes	No
Wisconsin	Leg. Act: Assembly Bill #30 Chapter #207 Laws of 1969 7/1/70	No		Yes	Yes
Wyoming	Leg. Act: S.F. #71, 40th Session 1/1/70	Yes	Yes	Yes	No

...LY ...LING	LEASED BUILDINGS	RESPONSIBLE FOR ENFORCEMENT	INSPECTION OF NEW BUILDINGS	REMARKS
	No	Shall lie with the building department of each county, city, town or political subdivision of the State. Where State school funds are utilized—by the superintendent of public instruction. Where State funds are utilized—by the State agency having the statutory authority for design and construction of buildings covered by this Act. Where funds of counties, municipalities, or other political subdivisions are utilized—by the respective governing bodies thereof.	No	
	No	Director of the Division of Vocational Rehabilitation of the State Board of Education.		Waiver Clause: "The director shall have the authority to exempt buildings and facilities from the provisions of this article . . . in whole or part, if, in his opinion, compliance therewith would create a financial hardship, be impractical or serve no benefit."
		State Department of Industry, Labor and Human Relations or in lieu thereof with the approval of the municipality wherein the building is located.		Limited to providing "reasonable means of ingress and egress by the physically handicapped . . ."
	No	State Fire Marshall	Yes	Waiver Clause: "If it appears that said features would impose an unreasonable expense upon the contracting authority which would more than offset the benefits obtained by their inclusion, the State Fire Marshall, with the ad-

THE PRESIDENT'S COMMITTEE ON EMPLOYMENT OF THE HANDICAPPED

WASHINGTON, D. C. 20210

Analysis of collected data on legislation and standards of 50 States and the District of Columbia concerning laws requiring that buildings and facilities be accessible to handicapped persons.

(Prepared by Research Office, School of Architecture, Syracuse University, under contract from the U. S. Department of Housing and Urban Development)

1975

e Review

Scope

		Building types covered													Phase of construction								Enforcement and Review			
			Public					Private																			
			Public funds (general)	State owned	State leased	Municipally owned	Schools	Places of assembly	Residential (includes apts)	Commercial	Industrial	Accommodations (hotels)	Health facilities		Existing	Alterations/renovations	Additions	Contract in process	Contract document completed	Under construction	New construction		Building Code Council	Local municipality	State Fire Marshal	State Administrative Agency
NEW ENGLAND																										
ticut	CT		X	X		X	/	/	/	/	/	/				X	X			X		X		R		R
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husetts	MA		X	X		X	X	X	/	X		X				X	X					X		E		E
mpshire	NH		X				X															X		E		R
Island	RI		X	X		X		X			X		X							X	X			E		E
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MIDDLE ATLANTIC																										
re	DE		X													X	X					X				R
of Columbia	DC		X																			X				
nd	MD		X	X		X	X	X	/							X	X					X		E		R
rsey	NJ		X				X															X		E		R
rk	NY		X				X	X	/			X				X	X					X	R E	E		R
Carolina	NC		X	X	X	X	X	X	/	X	X	X	X			X	X					X	R E	E		E
lvania	PA		X				X															X				E
ia	VA		X	X												X	X					X		R E		R
irginia	WV		X	/	/	/	X	X	/	X		X	X				X		X	X	X		R	E		R

ew; E: enforcement; X: requirement; /: partial requirement

ate Review

Scope

		Building types covered	Public					Private						Phase of Construction							Enforcement and Review			
			Public funds (general)	State owned	State leased.	Municipally owned	Schools	Places of assembly	Residential (inc. apts.)	Commercial	Industrial	Accommodations (hotels)	Health facilities		Existing	Alterations/renovation;	Additions	Contract in progress	Contract document completed	Under construction	New construction		Building Code Council	Local municipality	State Fire Marshal
SOUTHERN																								
bama	AL		X				X													X	X		E	
ansas	AR		X				X												X		X			
rida	FL		X	X	X	X	X	X	/	X	/	X				X	X				X		E	
rgia	GA		X				X									X	X			X	X		E	R_E
isiana	LA		X	X			X									X	X				X			R_E
sissippi	MS		X				X							/					X	/	X		E	
th Carolina	SC		X	X	X	X		X	/	/	/	X				X	X				X		E	E
nessee	TN		X	X	X	X														X	X		R_E	
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ouri	MO		X				X									/	/				X	E		
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onsin	WI		X				/		/	/	/	/				X	X			X	X		R_E	

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		Building types covered													Phase of Construction							Enforcement and Review				
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			Public funds (general)	State owned	State leased	Municipally owned	Schools	Places of assembly	Residential (inc. apts.)	Commercial	Industrial	Accommodations (hotels)	Health facilities		Existing	Alterations/renovations	Additions	Contract in process	Contract document completed	Under construction	New construction		Building Code Council	Local municipality	State Fire Marshal	State Administrative Agency
CENTRAL																										
do	CO		X															X	X		X				R
	KS		X				X									X	X				X				R
ka	NB		X																	X	X				
Dakota	ND		X																		X				R
ma	OK		X																		X				R
Dakota	SD		X															X			X				R
g	WY		X				X														X			R E	
WESTERN																										
	AL		X																		X				R
a	AZ		X				X	X	/	/		X	/								X		E		R
rnia	CA		X	X	X	X	X	X		X		X	X			X	X			X	X		E		R
	HI		X																		X				R
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I. INTRODUCTION

Stairs and steps, narrow doorways, and revolving doors inhibit convenient access to buildings by approximately 22 million people in the U.S. These 22 million people have physical handicaps that impede their ability to lead full and productive lives. Of these, 2 million have disabilities serious enough to affect the kind of work they do. Architectural barriers, such as inadequate restroom facilities and unreachable water fountains, public telephones, and elevator buttons, which have been thoughtlessly incorporated into the design of buildings and facilities deny full utilization of that building or facility by the handicapped. Many of these citizens have been denied education, recreation, employment and other opportunities due to architectural barriers. If the handicapped cannot enter and fully utilize public buildings, they cannot vote, conduct ordinary business, worship, or otherwise become independent, self-supporting members of society.

The purposes of the study were to determine what efforts are being made by state and local governments to eliminate architectural barriers to the handicapped and to examine the activities and attitudes of non-governmental agencies and private citizens as they relate to the effect of architectural barriers on handicapped persons.

The study has attempted to analyze state and local legislative enactments and executive directives designed to eliminate architectural barriers and the various administrative mechanisms and techniques established to implement such directives and enactments.

By utilizing the findings of published surveys by the National League of Cities, the policies, practices and attitudes of professionals related to the building field have been examined as they relate to the problem of architectural barriers.

II. STATE ACTION TO ELIMINATE ARCHITECTURAL BARRIERS TO THE HANDICAPPED

Summary of Formal and Legal Enactments by the States

states of Connecticut and Ohio have enacted legis lative acts that require the ANSI standards be used a design criteria for the construction of barrier-fre buildings, but do not incorporate the standards int the law. The states of Minnesota and North Carolin have adopted the ANSI standards into their Stat Building Codes. Delaware has enacted a law re quiring barrier-free construction but the design stand ards are contained in the law and only partially com ply with the ANSI. In the District of Columbia, e forts to eliminate architectural barriers were directe by executive order, but these directives do not mee ANSI specifications.

The legislative requirements or building code pr visions relative to architectural barriers in all th states apply to all new buildings constructed in fu or partially by funds of public, state or political sul divisions of the state origin. Nine states (Californi Connecticut, Illinois, Michigan, Minnesota, Ne York, North Carolina, Utah and Wisconsin) extende coverage of the legislative or building codes to in clude publicly used, but privately owned buildin and facilities. Six states (California, Florida, Ne York, North Carolina, Tennessee and Texas) exten barrier-free construction to leased buildings.

In addition, the laws of 22 states (California, Co necticut, Delaware, Florida, Georgia, Illinois, Louis ana, Massachusetts, Michigan, Minnesota, Mississipp New Mexico, New York, North Carolina, Oklahom Oregon, South Carolina, South Dakota, Texas, Uta Virginia and Washington) apply to buildings under ing substantial remodeling, rehabilitation, or renov tion, and the laws of four other states (Arizona, Iov Montana and Nebraska) apply to temporary an emergency construction as well as permanent.

The architectural barriers laws or regulations adopted in 33 states appear to be mandatory. Si teen states contain waiver clauses in their laws th provide for nonconformance in the event that co formance would work an unusual hardship, eith financially or in construction, or unreasonably co plicate the construction, alteration or repair. The waivers must be reviewed by the agency responsib for enforcement before the waiver is granted Clauses such as these are maintained by the states Alaska, Connecticut, Delaware, D.C., Florida, Idaho Mississippi, New Mexico, North Dakota, Ohio, Ok homa, Tennessee, Vermont, West Virginia, Wiscons

sylvania, South Dakota, Tennessee, Texas, Virginia, West Virginia, Wisconsin, and Wyoming.

In 14 states the enforcement responsibility is divided among three different agencies or political subdivisions' governing bodies. For state buildings, a state agency is responsible; for school buildings, a different state agency, a board of regents or the governing body of a political subdivision is responsible for enforcement; and for local public buildings, the governing body of the political subidivision in which the building is located is responsible. The 14 states that adhere to this method of delegating enforcement responsibility are: Alabama, Arizona, Colorado, Kentucky, Maine, Maryland, Massachusetts, Missouri, Montana, Nebraska, New Hampshire, Oklahoma, South Carolina, and Utah.

Four states, Florida, Idaho, Nevada and New Jersey leave enforcement responsibility for the removal of architectural barriers to the "contracting authority" responsible for construction. Two states, California and Kansas, have empowered the same state agency to enforce barrier-free construction laws for all state-funded buildings and public school buildings.

The same states leave the enforcement for local public buildings to the individual governing bodies of the political subdivision in which the building in question is located. Two states, Michigan and Vermont, delegate enforcement responsibility for state-funded buildings and local public buildings to a state agency and leave enforcement for schools to the political subdivisions.

One state, Washington, leaves enforcement of barrier-free construction of all buildings in question to the governing body of the political subdivision in which the building is located.

And only one state, Rhode Island, does not delegate responsibility for enforcing barrier-free construction to anybody. Rhode Island has no enforcement agency for its law.

III. LOCAL GOVERNMENT EFFORTS TO ELIMINATE ARCHITECTURAL BARRIERS TO THE HANDICAPPED

Local governments, both municipal and county, have made only limited progress toward the elimination of architectural barriers in buildings and facili-

the 279 cities and towns, and 272 counties that responded to the study's questionnaires, only 95 cities and 42 counties reported local efforts to eliminate barriers.

Of the 95 cities and 42 counties that have made efforts to eliminate architectural obstacles to the handicapped, approximately 56 cities and 27 counties base their efforts on some form of legal or formal action, including ordinances, building code provisions, council resolutions, and executive or departmental directives. About 26 cities and 6 counties have based their efforts solely on state statutory or code requirements.

Despite the fact that over one-half of the respondent cities have established official policies relative to architectural barriers, few have adopted the ASA Specifications as the standard for their efforts to eliminate such barriers.

Only officials in seventeen cities were sufficiently informed about the content of their state statutory or code requirements on the subject to report that these specifications were incorporated therein.

The great majority of the cities and counties ordinances and directives are applicable solely to new public buildings and facilities, and the majority of these are not even mandatory.

The need for elimination of architectural barriers has not been demonstrated to a very substantial number of officials of political subdivisions and these political subdivisions tend to favor state legislation to eliminate architectural barriers to the handicapped because of the absence of a clear need for action by local government.

IV. ATTITUDES AND ACTIVITIES OF PROFESSIONAL, TRADE, AND FACILITY OPERATOR'S ORGANIZATIONS

Efforts to eliminate architectural barriers to the rehabilitation of the handicapped have been directed primarily at architects and local, state and federal governments. The impact of these efforts on the various levels of governments can be quantified: statutes and ordinances passed, resolutions adopted, or building codes amended. However, efforts to eliminate architectural barriers also affect manufacturers and suppliers of materials and equipment used in

more buildings in which obstacles to handicapped individuals were eliminated in the design stage.

A survey by the National League of Cities of the building materials manufacturers and suppliers showed that only half were familiar with the ANSI specifications and of that half the majority thought their product would have to be altered for use by the physically handicapped.

Most of the national special interest groups are aware of the accessibility problems encountered by the disabled and feel that the elimination of architectural barriers is a worthwhile cause. Relatively few of these groups, however, have formulated a policy on this matter and even fewer have made an effort to inform their members of mobility problems of the physically handicapped.

Legislation is the most controversial aspect of the architectural barriers problem. The majority of architects and special interest groups recognize the social desirability of legislation that would eliminate architectural barriers to the handicapped. However, these groups indicated deep concern that such legislation might increase costs appreciably, inhibit creativity, or be unnecessarily restrictive. Their support or opposition to such legislation would be contingent upon these factors.

V. PUBLIC AWARENESS OF ARCHITECTURAL BARRIERS

About 18% of the people in this country are directly affected by the problem of architectural barriers. Seven percent of these are themselves handicapped and the other eleven percent have handicapped persons in their families. And yet, although the majority of people in this country are aware of the problem, the majority also is not particularly concerned about it.

Generally speaking, women and the young and highly educated are more aware and concerned about the problem than the general populace.

Once people have been introduced to the problem, their reaction is generally favorable. Potential public support for the institution of barrier elimination programs appears relatively high; once the general population is made aware of the problem, they tend to consider it a fairly serious problem and the majority

Most of the efforts made in connection with barrier elimination and handicapped interest groups seem to be directed inward within the groups themselves, except for the compiling and publicizing of the ANSI specifications.

More emphasis should be placed on making outside business, social and governmental groups aware of the problem of architectural barriers to the handicapped.

VII. COST OF BARRIER FREE CONSTR

Contrary to the fears of many contractors and businessmen, the cost of barrier free construction is a relatively small increase, substantially less than one percent of total construction costs unless an elevator must be added to the structure. With much of the new building construction as either one story, a does not require an elevator for accessibility, or over three stories in height, and an elevator would already be a necessary component of the construction costs, the number of cost increases attributable to elevator installation for the specific purpose of making buildings and facilities accessible to, and able by, the handicapped may be relatively few.

VIII. COMPARISON OF THE FOUR BUILDING CODES WITH THE ANSI SPECIFICATIONS

There are four major building codes in the U The Southern Standard Building Code of the Southern Building Code Congress; the Uniform Build Code of the International Conference of Building Officials; the National Building Code of the Americ Insurance Association; or the Basic Building Code the Building Officials Conference in America

The codes are remedial regulations that are rected toward three areas: (1) stability and stur ness of construction, (2) fire safety, and (3) hea and sanitation.

None of the codes have ex post facto applicati their provisions do not apply retroactively to bu ings constructed before the code was adopte

A chart of how the different building codes c pare with the ANSI specifications for specific c

None of the building codes have any specifications for exterior grading and walks. The ANSI specifications read as follows:

> Ground should be graded to attain a level with a normal entrance. Walks should not be less than 48" wide, slope should not exceed 5%, no steps or abrupt changes in level allowed.

Parking Lots and Garages --

Only the Code of the Building Officials Conference of America has any specification pertaining to parking lots or garages. They specify that:

> Parking lots shall afford ready means of entrance and exit at sidewalk level. Parking spaces shall be not less than 8' by 18' in area for each vehicle.

Whereas the ANSI specifications are --

> Accessible, convenient spaces should be provided for the disabled. Space should be open on one side, should be 12' wide. Spaces should be planned so that disabled do not have to pass behind parked cars.

Entrances and floors --

None of the major building codes have any pertinent specifications on entrances and floors. The ANSI reads as follows:

> At least one primary entrance to each building shall be usable by persons in wheelchairs. Floors shall have non-slip surface. Floors on a given story shall be level throughout or be connected by a ramp.

Doors and Doorways --

The ANSI Code reads:

> Doors shall have clear opening of no less than 32" and shall be operable by a single effort. Thresholds shall be flush with the floor. Floor on each side of doorway shall be level for a distance of 5'

The Code of American Insurance Association only specifies 28" wide doors; the Code of Building Officials Conference of America specifies 30" -44"; the others meet or exceed door width requirements. None of the codes specify flush thresholds or a level distance on either side of the door.

yond each side of doorway. Ramps must ha platforms at 30' intervals and wherever there is turn.

Water Closets and Facilities --

The Code of International Conference of Buildi Officials is the only code that mentions water close other than there should be a sufficient number, a they do not specify any to be accessible to the han capped.

The ANSI specifications for Ramps are:

> Slope not to exceed 1' in 12'. Ramp must ha non-slip surface, platform at top 5' wide and 3' long and a 6' clearance at the bottom. Level platform required at 30' intervals. No width sp cifications.

All four building codes are similar to these speci cations.

Exitways --

All building codes match or exceed the ANSI sp cifications.

Stairs, Railings, Corridors --

Stair treads and risers: all building codes mat or exceed ANSI specifications

Lighting --

All building codes match or exceed the ANS specifications.

Specifications for making public telephones, ligh heating or elevator controls accessible to, and usab by the physically handicapped are not included any of the four major building codes. Special iden fication and warning signals for those with sight hearing disabilities are not discussed.

1. Parking Spaces—not less than 12 feet wide, uniform, non slip surface, adjacent to level walkway

B. Grade Change
   1. Curbs—inclined curb approach, gradient not more than 1 foot in 3 feet, width not less than 4 feet
   2. Ramps and Handrails—gradient not more than 1 foot in 12 feet, level platform 5 feet long at top and bottom, at turns and at intervals of not more than 30 feet on long runs, width (inside handrails) not less than 3 feet
      Handrails—2 feet 8 inches high on both sides extending 1 foot beyond top and bottom of ramp at least on one side
   3. Surface—non-slip
   4. Stairs and Handrails—risers not more than 5¾ Inches, tread minimum of 14 inches wide, nosing radius not less than ⅛ inches, handrails to be 2 feet 8 inches above nosing on both sides

C. Building Access
   1. Width—clear width, not less than 2 feet 8 inches when open
   2. Floor-level for distance of 5 feet from door in direction of swing, extend 1 foot to one side of latch jamb
   3. Threshold—minimum rise and inclined
   4. Handles—maximum pressure to open a door should not exceed 8 pounds, handle should be 3 feet 6 inches from floor, handles should be knurled for blind to identify a hazard, knobs or taps operated by turning or pull-type handles are to be avoided, horizontal levers are preferable

D. Comfort Facilities
   1. Toilet Room—clear space, excluding door swing, not less than 5 feet by 4 feet, clear space between face of water closet stall and wall not less than 4 feet
   2. Water Closet Stall—not less than 3 feet wide and 4 feet 8 inches deep, outswing door or opening 2 feet 8 inches wide, handrails (both sides) not less than 3 feet 6 inches long and mounted 2 feet 9 inches above and parallel to the floor
   3. Lavatory—wall mounted with space under the unit open and unobstructed, narrow apron with bowl and controls near the front, knobs or taps operated by turning are to be avoided
   4. Urinals—wall mounted, basin opening not more than 1 foot 7 inches above floor
   5. Accessories—shelf, disposal unit and lower edge of mirror not more than 3 feet 4 inches above floor, towel dispenser not more than 4 feet above floor
   6. Drinking Fountain—wall mounted with spout and control at front with basin not more than 3 feet above floor
   7. Telephone—outside a booth, with dial and handset not more than 4 feet above floor, specially equipped handset for hard of hearing with instructions, raised numbers and raised letters instructions for blind

G. Signing
   1. Warning—regular acoustic alarm systems should be equipped with optic (flashing lights) warning system for the deaf, regular optic system should be equipped with acoustic system for the blind.

State Legislation	National and State Organization Guidelines
WHEELCHAIRS	
A. Transportation Mode Change	
1. parking spaces	
B. Grade Change	
1. curbs	
2. ramps and handrails	
3. surface	
C. Building Access	
1. width of opening	1. kick plates—16" from floor
2. floor	2. time-delay of 6 sec. on self-closing doors
3. threshold	
4. handles	
D. Comfort Facilities	
1. toilet room	
2. water closet stall	
3. lavatory	
4. urinal	
5. accessories	
6. drinking fountains	
7. telephones	
E. Active Recreation Areas	1. access and egress to areas of participation a ive areas
F. Paths	1. non-slip, uniform surface, where 2 paths inte change is needed for warning
G. Signing	1. paths, stairs, path intersections and ramps
H. Lighting	lighted with a minimum of 5' candles of whi
I. Seating	
J. Walls	
K. Canopies	
L. Surfacing	
BRACES	
A. Transportation Mode Change parking spaces	
B. Grade Changes	
1. curbs	
2. ramps and handrails	
3. surface	
C. Building Access	

State Legislation	National and State Organization Guidelines
D. Comfort Facilities 1. toilet room 2. water closet stall	
E. Active Recreation Areas	1. access and egress to areas of participation and su facilities 2. broad steps and handrail to pool
F. Paths	1. non-slip, uniform surface, where 2 paths intersect a change is needed as warning
G. Signing	
H. Lighting	1. paths, stairs, path intersections and ramps should lighted with minimum of 5' candles of white light
I. Seating	
J. Walls	
K. Canopies	
L. Surfacing	
CRUTCHES	
A. Transportation Mode Change parking spaces	
B. Grade Change 1. stairs and handrails 2. surface	
C. Building Access 1. width of opening 2. floor 3. handles	1. kick plates—16" from floor 2. time-delay of 6 seconds on self-closing doors
D. Comfort Facilities 1. toilet room 2. water closet stall	
E. Active Recreation Areas	1. access and egress to areas of participation and portive facilities 2. broad steps & rail to pools
F. Paths	1. non-slip, uniform surface, where 2 paths intersect change is needed as warning
G. Signing	
H. Lighting	

CANE

A. Transportation Mode Change

B. Grade Change
surface
stairs and handrails

C. Building Access
1 width of opening
2. floor
4 handles

1. kick plates—16" from floor
2. time-delay of 6 sec. on self-closing door

D. Comfort Facilities

E. Active Recreation Areas

F. Paths

1. uniform, non-slip surface where 2 paths intersect a change is needed as warning

G. Signing

H. Lighting

1. paths, stairs, path intersections and ramps should lighted with minimum of 5' candles of white light

I. Seating

J. Walls

K. Canopies

L. Surfacing

AMPUTEE (UPPER)

A. Transportation Mode Change

B. Grade Change

C. Building Access
Handles

D. Comfort Facilities

1. knobs or taps operated by pulling or turning ar avoided, push button type levers are preferable

E. Active Recreation Areas

F. Paths

G. Signing

H. Lighting

1. paths, stairs, intersecting paths and ramps should lighted with a minimum of 5' candles of white light

Seating

State Legislation	National and State Organization Guidelines
BLIND	
A. Transportation Mode Change	
B. Grade Change	
C. Building Access Handles	
D. Comfort Facilities Telephones .	
E. Active Recreation Areas	
F. Paths	1. non-slip, uniform surface, where ture change is needed for warnin 2. contrasting color or texture is n curbs or rails at all turns or dange
G. Signing Warning System	1. should be in raised numbers or l
H. Lighting	
I. Seating	1. paths, stairs, path intersections a
J. Walls	lighted with a minimum of 5' can
K. Canopies	
L. Surfacing	
DEAF	
A. Transportation Mode Change	
B. Grade Change	
C. Building Access	
D. Comfort Facilities 7. Telephone	
E. Active Recreation Areas	
F. Paths	
G. Signing Warning System	1. should be optical and easily read
H. Lighting	

Leg. & Date Effective	Application of Act	St.*	Remod.	Bldgs.			Bldgs.	New Bldg.	Remarks
ALABAMA									
Leg. Act 224 Eff. 8/9/65	All bldg. & fac. used by public constructed in whole or part by state funds or funds of any pol. sub-div. or where state interest	ANSI spec adopted in toto	X	X	St. Bldg. Comm.	State Bd. of Ed. & St. Bldg Comm.	Pol. sub-div.	✓	—
ALASKA									
Leg. Act: #303 Amended by Senate Chapter#119 1/1/67	All public Buildings constructed by state and political	Adopt. ANSI	X	X	Dep. of Public Works			X	Waiver Clause: "The regulations of the department shall conform as far as it is feasible to the standards of ANSI"
ARIZONA									
Leg. Act: #113 Chapter #65 1/1/68 amended Leg. Act: #2045 July, 1973	All buildings & facilities used by public constructed in whole or in part with state funds of any political subdivision or where state interest involved. Inc. temp. & emergency constr.	Adopt. spec ANSI in toto	X	X	State agen.	Bd. of Regents or Jr. College Dists. or Sch. Dists.	Political subdivisions	X	—
ARKANSAS									
Leg. Act #122 House bill #257 2/21/67	All buildings of assembly, educational institutions and office buildings constructed in whole or part with state funds or funds of any political subdivision.	Yes	X	X	Dept. of Health			✓	—
CALIFORNIA									
Leg. Act Assem. Bill #2238 Gen. Assem. 710 6/7/71	Includes all publicly funded Bldg. and pub. used, privately owned bldgs.	Yes	✓	✓	Director of Dept. of General Serv.		Pol. sub-div.	Yes gov't no private	Bill also includes sidewalks, curbs, and related fac.
COLORADO									
Leg. Act Senate Bill #47 5/27/65	All public bldg. constructed by state and pol. sub-div. of state	Yes	X	X	State Public Works Div.	Pol. sub-div. except St. colleges or Univ.	Pol. sub-div.	X	
CONNECTICUT									
Leg. act House bill #3863 Public Act #216 6/23/65 amended House Bill #8518 1/1/73	Includes all public bldg. & fac. constr. by state funds & pol. sub. funds and pub. used, privately owned bldg.	In part req. as source of design criteria, reg. promulgated by st. agency under leg. directive	✓	X	Dept. of Public Works			X	Waiver Clause: The public works commissioner can set aside or modify any particular standard or specification when it is determined that it is practical and would unusual hardship or unreasonably complicate the construction.

Leg. & Date Effective	Application of Act	Compliance Adopts ANSI St.*	Remod.	Leased Bldgs.	Enforcements: State Bldg.	Enforcements: School Bldgs.	Enforcements: Local Public Bldgs.	New Bldg.	Remarks
KANSAS									
Leg. Act Senate Bill #517 1/1/69	Publicly Funded bldg.	Yes	If > 25% gross area	X	Architectural Div. of State Dept. of Administration		Pol. subdiv.	X	
KENTUCKY									
Senate Bill #167 General Ass. 3/24/66	All public bldg. constructed by state & pol. subdiv. of state	No	X	X	State agencies	Pol. subdiv.	Pol. subdiv.	X	
LOUISIANA									
Leg. Act #204 House Bill #100 6/28/66	All publicly funded bldg.	Yes	✓	X	State Fire Marshall			X	
MAINE									
Leg. Act H P #1114 L D #1583 Creating Part #7 Chapter #331 6/6/67 SP #100-LD #310 3/13/69 L.D. #657 4/2/73	All publicly funded bldg.	Yes	✓ > $100,000	X	Public Improvement Director	Comm. of Education	Pol. subdiv.	✓	
MARYLAND									
Leg. Act Senate Bill #404 added new Sec. #51 to Article #78 A 7/1/68	Publicly funded buildings	Yes	X	X	General Services Adm.	State Dept. of Education	Pol. subdiv.	✓	Possible Waiver Clauses: This act contains provision stating that barrier free public buildings and facilities should be suitably marked by an "accessible to the handicapped" symbol. Act also applies to publicly funded—publicly used transportation accommodations which are engaged in mass transportation.
MASSACHUSETTS									
Leg. Act Senate Bill #1427 Chapter #22 as amended by Chap. #724 Leg. Act #3537 1/21/68	Publicly funded buildings	Yes	✓	X	Super. of Public Bldgs	Gov. Body	Pol. subdiv.	X	
MICHIGAN									
Leg. Act #1 7/1/65 Amended Leg. Act #293 7/1/73	Publicly funded bldg. Publicly used Privately owned	Yes	✓	X	State Building Division	Dep. of Education	State Bldg. Div.	X	
MINNESOTA									
State Building code 6/1/71	Publicly funded bldg. Publicly used	Yes	Yes	X	State Building Code Inspector			✓	

Leg. & Date Effective	Application of Act	Compliance Adopts ANSI St.*	Remod.	Leased Bldgs.	Enforcements: State Bldg.	Enforcements: School Bldgs.	Enforcements: Local Public Bldgs.	New Bldg.	Remarks
MISSISSIPPI									
Leg. Act Senate Bill #2131 7/1/72	Publicly funded bldg.	No	✓	X	State Board of Health			X	Waiver Clause: "Except where such compliance is impractical in the opinion of the State Board of Health
MISSOURI									
Leg. Act House Bill #311 (1967)	Publicly funded bldg.	No	X	X	State Planning & Constr. Division	State Dept. of Educ.	Pol. subdiv.	X	
MONTANA									
Leg. Act House Bill #345 Chapter #223 3/8/65	Publicly funded bldg.— emergency and temporary too	Yes	X	X	State Controller	State Supv of Public Instr.	Pol. subdiv.	X	
NEBRASKA									
Leg. Act #584 11/16/65	Publicly funded bldg.— emergency & temporary bldg	Yes	X	X	Comm. of Labor	Comm. of Educ.	Pol. subdiv.	X	
NEVADA									
Leg. Act Senate Bill #446 3/13/73	Publicly funded bldg.	Yes	X	X	Contracting officer or authority			X	
NEW HAMPSHIRE									
Leg. Act House Bill #59 7/1/65	Publicly funded Bldg.	Yes	X	X	Dept. Public Works	State Board of Ed.	Pol. subdiv.	X	
NEW JERSEY									
Leg. Act Assembly Bill #1192, #355 (1972)	Publicly funded bldg.	Yes	X	X	Contracting Authority			X	
NEW MEXICO									
Leg. Act House Bill #303 Chapt. #194 3/25/65	Publicly funded bldg.	Yes	✓	X	State Construction Industry Board			✓	Waiver Clause: Any particular standard may be waived if the governing authority responsible for the construction and board find the requirements: "impracticable."
NEW YORK									
Leg. Act Chapt #656 9/1/72	Publicly funded bldg., publicly used, privately owned	Yes	✓	✓	Official governing body or board having design approval authority			✓	516 municipalities subscribe to the State Building Code which provides for accessible ?tion.
NORTH CAROLINA									
State Building Code 3/13/73	Publicly funded bldg., publicly used, privately	Yes	✓	✓	N.C. Dept of Insurance			✓	

Leg. & Date Effective	Application of Act	Compliance Adopts ANSI St.*	Remod.	Leased Bldgs.	Enforcements: State Bldg.	Enforcements: School Bldgs.	Enforcements: Local Public Bldgs.	New Bldg.	Remarks
NORTH DAKOTA									
Leg. Act House Bill #1129 7/1/73	Publicly funded bldg.	Yes	X	X	State Construction Superintendent			✓	Waiver Clause: In cases of practical difficulty, unnecessary hardship or extreme differences the State construction superintendent grant exceptions from the literal requirements of the standards provided by this act or permit the use of other methods or material but only when it is clearly evident that reasonably equivalent facilitation and protection are thereby secured.
OHIO									
Leg. Act #124 General Assembly 1/1/66	Publicly funded	No ANSI spec. required as design criteria	X	X	Board of Building Standards			X	Waiver Clause: "The Board of Building Standards shall adopt standards, rules and regulations to facilitate the **reasonable** access and use by all handicapped persons of all public buildings the facilities thereof erected after Jan. 1966. The Board of Building Standards adopted in 1966 the ANSI *standard pertaining to publicly funded* buildings. Waiver Clause is in Board of Building Standards: "The chief enforcement official may permit iance from the provisions . . . where the of compliance would be substantially down proportionate to the total cost and anticipated use of the structure.
OKLAHOMA									
Leg. Act #956 1/2/66	Publicly funded bldg.	Yes	✓	X	Board of Public Affairs	Pol. subdiv.	Pol. subdiv.	X	Waiver Clause: Facilities shall be provided "For the handicapped to the extent deemed feasible by the contracting authority. Insofar as feasibly and financially reasonable in the opinion o the contracting authority, such facilities shall conform with the (Standards of ANSI)
OREGON									
Leg. Act House Bill #1074 unknown date	Publicly funded bldg.	Yes	✓	✓	State Fire Marshall			✓	
PENNSYLVANIA									
Leg. Act #348 Act of Gen. Assem. #235 9/1/65	Publicly funded	Yes	X	X	Dept. of Labor and Industry			✓	
RHODE ISLAND									
Leg. Act 1964	Publicly funded bldg.	Yes	X	X	None			X	

Leg. & Date Effective	Application of Act	Compliance Adopts ANSI St.*	Remod.	Leased Bldgs.	State Bldg.	School Bldgs.	Local Public Bldgs.	New Bldg.	Remarks
SOUTH CAROLINA									
Leg. Act House Bill #1438 4/27/73	Publicly funded bldg	Yes	✓	X	Chief of Engineering Staff of State Budget & Control Bd.	State Education Finance Committee	Pol. subdiv.	X	Amendment to law includes tax deduction for renovation of building or facility intended to be used and is actually used by the general public. The minimum renovation required shall include one or more of the following: ground level or ramped entrance, free movement between public use areas and washroom and toilet facilities accessible to and usable by physically handicapped persons.
SOUTH DAKOTA									
Leg. Act Senate Bill #162 Chapter #312 7/1/65	Publicly funded	Yes	✓	X	State Engineer			✓	Effective 7/1/71, the international symbol of access must be displayed at the entrance of public buildings and facilities in SD if such structures have provisions to accommodate wheelchair users.
TENNESSEE									
Leg. Act Senate Bill #641 Chapter #484 2/25/70	Publicly funded	Yes	X	✓	Department or agency of State or subdivision which has primary responsibility for design of public bldg.			✓	Waiver Clause: "The minimum specifications shall be complied with . . . unless the Responsible Authority (in his respective area) shall determine that compliance is reasonably impracticable from either an architectural or a financial standpoint, in which event such compliance as is reasonably practicable shall be effected."
TEXAS									
Leg. Act Senate Bill#111 Chapter #324 1/1/70	Publicly funded bldg. also federally funded bldg	Yes	✓	✓	State Building Commission with legal support from District Court			✓	
UTAH									
Leg. Act 1969	Publicly funded bldg., publicly used privately owned bldg.	Yes	✓	X	State Building Board	State Board of Ed.	Pol. subdiv.	✓	
VERMONT									
Leg. Act House #49 7/1/67	Publicly funded	Yes	X	X	Dept. of Public Safety	State Board of Ed.	Dept. of Public Safety	X	Waiver Clause: "The building construction specifications at the time of construction shall as far as practicable, be equal to ANSI 117.1
VIRGINIA									
Leg. Act Chapt. #539 6/26/70	Publicly funded	Yes	✓	X	Director of the Division Office of Engineering and Buildings			X	
WASHINGTON									
Leg. Act House Bill #841 1971	Publicly funded bldg.	Yes	✓	X	Building Dept. of respective pol. subdiv.			X	

Leg. & Date Effective	Application of Act	Compliance Adopts ANSI St.*	Remod.	Leased Bldgs.	Enforcements: State Bldg.	Enforcements: School Bldgs.	Enforcements: Local Public Bldgs.	New Bldg.	Remarks
WEST VIRGINIA									
Leg. Act House Bill #676 7/1/09	Publicly funded	No	X	X	Director of Division of Vocational Rehab. of State Board of Education			X	Waiver Clause: "The director shall have the authority to exempt buildings and facilities from the provisions of this article . . . in whole or part, if, in his opinion, compliance therewith would create a financial hardship, be impractical or serve no benefit.
WISCONSIN									
Leg. Act #30 Chapter #207 Laws of 1969 7/1/70	Publicly funded bldg., publicly used, privately owned bldg.	No	X	X	Pol. subdiv. and State Department of Industry, Labor and Human Relations			X	Limited to providing "reasonable means of ingress and egress by the physically handicapped . . ."
WYOMING									
Leg. Act S. F. #71 1/1/70	Publicly funded	Yes	X	X	State Fire Marshall			✓	Waiver Clause: "If it appears that said features would impose an unreasonable expense upon the contracting authority which would more than offset the benefits obtained by their inclusion, the State Fire Marshall, with the advice & counsel of the Director of Vocational Rehabilitation, may waive said requirements.

*ANSI refers to Am. Nat'l. Stand. Inst. for making Bldg. & Acc. to and useable by phys. hand. ANSI 117.1—1971

Legislation & Date Effective	Application of Act	Compliance Adopts ANSI Standards	Covers Remodeling	Covers Leased Buildings	Enforcements: State Buildings	Enforcements: School Buildings	Enforcements: Local Public Buildings	Covers Inspection of New Buildings	Remarks
Leg Act #294 (Eff 8/9/65)	All bldgs and fly. Used by pub and semi-pub instrumentalities in part by State funds. Used of any (by?) bldgs of agencies of State through pur. funded	Complete ANSI spec adopted	Yes	Yes	St. Bldg Comm	State Bd of Ed & St Bldg Comm	Pol subdiv	Yes	None
Leg Act #103 Amended by Senate Chapter #119 (1/1/67)	All pub bldgs constructed by State or Pol subdiv	Adopt ANSI spec as set	Yes	Yes		Dept of Public Works		Yes	Waiver Clause: "The regulations o meet shall conform as far as it is f to the standards of ANSI"
Leg Act #133 Chapter #65 (1/1/68) Amended Leg Act #2005 (July 1973)	All bldgs and facilities used by pub and semi-pub in whole or in part with State funds, of any pol subdiv of where State interests are involved (including temporary and relocatable construction	Complete ANSI spec adopted	Yes	Yes	State Agies	Bd of Regents or Jr College Dists or Sch Dists	Political subdivisions	Yes	None
Leg Act #122 House Bill #267 (2/21/67)	Includes all bldgs of assembly, ed institutions, and all pub bldgs constructed in whole or part with State funds, of any pol or sub-div on	Yes	Yes	Yes		Dept of Health		Yes	None
Assem Bill #2238 Sen Assem 710 (6/7/71)	Includes all pub funded and pub used bldgs. Also, privately owned bldgs. used by pub	Yes	Yes	Yes	Director of Dept of Gen Service	Pol subdiv	Yes, gov't or private		Bill also includes sidewalks curbs related facilities
Senate Bill #47 (5/27/65)	Includes all pub bldgs constructed by the State or political subdivs on of the State	Yes	Yes	Yes	State Pub Works Div	Pol subdiv except State Colleges or Univ	Pol subdiv	Yes	None
House Bill #960 Public Act #216 (6/23/65) Amended House Bill #958 (1/1/73)	Includes all pub bldgs and facilities constructed by State funds or political subdiv such funds. Also pub used - privately owned bldgs	Required as service of design criteria regulations promulgated by State agency under leg directive	Yes	Yes		Dept of Pub Works		Yes	Waiver Clause: The public works c can set aside or modify any particu or specification when it is determin unpract cal and would cause unus or unreasonably complicate the co alteration or repairing of a site or b
Senate Bill #264 (6/30/73)	Pub. funded bldgs.	Partial ANSI criteria contained in law	Yes	Yes		Secretary of Dept of Administrative Services		Yes	Waiver Clause: "For good and suff stated in writing concern severe ec hardship to the State or to the pol division involved." Waivers judged review committee.
Executive Order #65-413 (3/30/65)	Pub. funded bldgs	No	Yes	Yes		Dept of Bldgs and Grounds		Yes	Waiver Clause: "Design modificati accommodate handicapped people made to the extent feasible without significantly to the cost of constru
Leg Act #225(19d), Amended (7/1/65) Amended (7/1/72)	Pub. funded bldgs.	Yes	Yes	Yes	"Contracting Authority" in question			Yes	Waiver Clause: "Insofar as financ ible in the opinion of said contract authority, such facilities shall conf the (standards of ANSI")
Leg Act Senate Bill #412-CA-1 (4/3/72)	Pub. funded bldgs	No	Yes	Yes		State Fire Marshal		Yes	None
Leg Act #269 House Bill #158 (7/16/69)	Pub. funded bldgs	Yes	No but enforcement ag has rem policy	Yes	Dept of Accounting and Gen Services			Yes	None
Leg Act House Bill #21 Chapter #5 (7/1/67)	All pub. bldgs constructed with State or any pol. subdiv. funds	Yes	Yes	Yes	Contracting officer or authority of the State or its pol subdiv			Yes	Waiver Clause: Facilities and facil physically handicapped shall be p the extent deemed feasible by the officer or authority of the State or sub-div sions. Insofar as is feasibl opinion of said contracting officer, such facilities shall conform with t ards of ANSI")
Leg Act House Bill #2416 (1/1/68)	Pub owned bldgs also pub used - privately owned bldgs	Yes	Yes	Yes		Dept of Gen Services		Yes	Waiver Clause: "This standard sh applied to the extent deemed feas of rendering"
Leg Act Chap #49 (10/24/69)	Pub owned bldgs	Yes	Yes	Yes		Administrative Building Council		Yes	None
Leg Act Chap #104, Code of Iowa Senate File #352 (4/22/65)	All pub funded bldgs. Also emergency and temporary conditions	Yes	Yes	Yes	State Building Code Commissioner			Yes	None
Leg Act Senate Bill #517 (1/1/69)	Pub. funded bldgs	Yes	If greater than 25% gross area	Yes	Arch. Div. of State Dept of Admin		Pol subdiv	Yes	None
Senate Bill #167 General Assem	All pub. bldgs constructed by State pol. subdiv. of State	No		Yes	Yes	State agencies	Pol subdiv	Pol subdiv	Yes	None

	(7/1/68)									symbol. Act also applies to public publicly used non-public assembly where assembly is [illegible]
usetts	Leg. Act Senate Bill #1427 Chapter #22 as amended by Chap. #724. Leg. Act #3537 (1/21/68)	Pub. funded bldgs.	Yes	Yes	Yes	Supervisor of Pub. Bldgs.	Government body	Pol. subdiv.	Yes.	None
n	Leg. Act #1 (7-1/66) Amended Leg. Act #293 (7/1/73)	Pub. funded bldgs. Also pub. used privately owned bldgs.	Yes.	Yes.	Yes.	State Bldg. Div.	Dept. of Education	State Bldg. Div.	Yes.	None.
ota	State Building Code (6/1/71)	Pub. funded bldgs. Also pub. used - privately owned bldgs.	Yes.	Yes.	Yes.	State Bldg. Code Inspector			Yes.	None.
ippi	Leg. Act Senate Bill #2131 (7-1/72)	Pub. funded bldgs.	No	Yes.	Yes.	State Board of Health			Yes.	Waiver Clause: Except where [illegible] [illegible] the approval of the [illegible] of Health.
ri	Leg. Act House Bill #311 (1967).	Pub. funded bldgs.	No	Yes	Yes	State Planning & Constr. Division	State Dept. of Ed.	Pol. subdiv.	Yes.	None.
na	Leg. Act House Bill #345, Chapter #223 (3/8/65)	Pub. funded bldgs. Also, emergency and temporary bldgs.	Yes	Yes	Yes	State Controller	State Supervisor of Pub. Instr.	Pol. subdiv.	Yes.	None.
ska	Leg. Act #584 (11/16/65)	Pub. funded bldgs. Also emergency and temporary bldgs.	Yes	Yes	Yes	Comm. of Labor	Comm. of Ed.	Pol. subdiv.	Yes.	None.
a	Leg. Act Senate Bill #446 (3/13/73)	Pub. funded bldgs.	Yes	Yes	Yes	Contracting officer or authority			Yes.	None.
lampshire	Leg. Act House Bill #59 (7/1/65)	Pub. funded bldgs.	Yes	Yes	Yes	Dept. Pub. Works	State Board of Ed.	Pol. subdiv.	Yes.	None.
ersey	Leg. Act Assembly Bill #1192, and #355 (1972)	Pub. funded bldgs.	Yes	Yes	Yes	Contracting Authority			Yes.	None.
lexico	Leg. Act House Bill #303, Chap. #194 (3/25/65).	Pub. funded bldgs.	Yes	Yes	Yes	State Construction Industry Board			Yes.	Waiver Clause: Any particular stat [illegible] of the governing authority [illegible] for the [illegible] and the board [illegible] impracticable."
ork	Leg. Act Chap. #656 (9/1/72)	Pub. funded bldgs. Also pub. used - privately owned bldgs.	Yes	Yes	Yes	Official governing body or board having design approval authority			Yes.	[illegible] [illegible] subject to the [illegible] Code which prov. [illegible] [illegible]
Carolina	State Building Code (3/13/73)	Pub. funded bldgs. Also pub. used - privately owned bldgs.	Yes	Yes	Yes	N.C. Dept. of Insurance			Yes.	None.
Dakota	Leg. Act House Bill #1129 (7/1/73)	Pub. funded bldgs.	Yes	Yes	Yes	State Construction Superintendent			Yes	Waiver Clause: "...[illegible] of particular [illegible] [illegible] hardship or extreme [illegible] the State construction superintendent [illegible] from the literal [illegible] of the standards provided by this [illegible] of the use of other methods or m [illegible] only when it is clear or evident th [illegible] ably equivalent facilitation and pr [illegible] thereby secured."
	Leg. Act #124, General Assembly (1/1/66)	Pub. funded bldgs.	No ANSI spec. required as design criteria	Yes	Yes	Board of Bldg. Standards			Yes	Waiver Clause: "The Board of Bu [illegible] ards, shall adopt standards, rules [illegible] here, to facilitate the reasonable [illegible] use by all handicapped persons o [illegible] buildings and the facilities thereo [illegible] after Jan. 1966. The Board of Buil [illegible] ards adopted in 1966 the ANSI "s [illegible] pertinent to publicly funded build [illegible] Waiver clause is in Board of Buildi [illegible] ards." The chief enforcement offic [illegible] permit variance from the provision
a	Leg. Act #956 (1/2/66)	Pub. funded bldgs.	Yes	Yes	Yes	Board of Pub. Affairs	Pol. subdiv.	Pol. subdiv.	Yes	Waiver Clause: Facilities shall be [illegible] "For the handicapped to the exter [illegible] feasible by the contracting author [illegible] as feasibly and financially reasona [illegible] opinion of the contracting authori [illegible] *facilities shall conform with the* (S [illegible] of ANSI")
	Leg. Act House Bill #1074 (unknown date)	Pub. funded bldgs.	Yes	Yes	Yes	State Fire Marshal			Yes	None
ania	Leg. Act #348, Act of Gen. Assem. #235 (9/1/65)	Pub. funded bldgs.	Yes	Yes	Yes	Dept. of Labor and Ind.			Yes	None.
and	Leg. Act 1964 (1/19/64)	Pub. funded bldgs.	Yes	Yes	Yes	None			Yes	None
olina	Leg. Act House Bill #1438 (4/27/73)	Pub. funded bldgs.	Yes	Yes	Yes	Chief of Engineering Staff of State Budget & Control Bd.	State Ed. Finance Committee	Pol. subdiv.	Yes	Amendment to law includes [illegible] [illegible] renovation of building or facility [illegible] be used and is actually used by th [illegible] public. The minimum renovation [illegible] include one or more of the follow [illegible] level or ramped entrance, free ing [illegible] between public use areas and wa [illegible] toilet facilities accessible to and [illegible] physically handicapped people
ota	Leg. Act	Pub. funded bldgs.	Yes	Yes	Yes		State Engineer		Yes	Effective 7/1/71, the interpretation

	Senate Bill #841, Chapter #484 (2/25/70)					which has primary responsibility for design of pub bldgs			shall be complied with unless t sible Authority (in his respective ar determine that compliance is reaso impracticable from either an archite *financial standpoint*, in which event compliance as is reasonably practic be effected."
	Leg Act Senate Bill #111, Chapter #324 (1/1/70)	Pub funded bldgs. Also, Fed funded bldgs	Yes	Yes	Yes	(higher ed pol subdiv.) State Bldg Commission with legal support from District Court		Yes	None
	Leg Act 1968 (no date)	Pub funded bldgs. Also, pub used – privately owned bldgs	Yes	Yes	Yes	State Bldg Board	State Board of Ed	Pol subdiv.	Yes	None
	Leg Act House #49 (7/1/67)	Pub funded bldgs	Yes	Yes	Yes	Dept of Pub Safety	State Board of Ed	Dept of Pub Safety	Yes	Waiver Clause: "The building consi specifications at the time of constru as far as practicable, be equal to A
	Leg Act Chapt #539 (6/26/70)	Pub funded bldgs	Yes	Yes	Yes	Director of the Div Office of Engineering and Bldgs			Yes	None
on	Leg Act House Bill #841 (1971)	Pub funded bldgs	Yes	Yes	Yes	Bldg Dept of respective pol subdiv			Yes	None
inia	Leg Act House Bill #676 (7/1/69)	Pub funded bldgs	No	Yes	Yes	Director of Div of Vocational Rehab of State Board of Ed			Yes	Waiver Clause: "The director shall *authority to exempt buildings and* from the provisions of this article or part of, in his opinion, compliance would create a financial hardship, b impractical or serve no benefit
n	Leg Act #30 Chapter #207 Laws of 1969 (7/1/70)	Pub funded bldgs. Also pub used privately owned bldgs	No	Yes	Yes	Pol subdiv and State Dept of Ind Labor and Human Relations			Yes	Limited to providing reasonable a ingress and egress by the physical capped
	Leg Act S.1 #71 (1/1/70)	Pub funded bldgs	Yes	Yes	Yes	State Fire Marshal			Yes	Waiver Clause: "If it appears that *would require an unreasonable exp* the contracting authority which wo than offset the benefits obtained by inclusion. The State Fire Marshal advice & counsel of the Director of *Rehabilitation*, may waive said requ

es to American National Standards Institute for making buildings
ccessible to and usable by the physically handicapped
1 (1971)

(1) Based on Analysis of State Laws and Regulations relative to Architectural Barriers state governments have made considerable progress during the last five years in their efforts to make publicly owned buildings and facilities freely accessible to the physically handicapped. Such efforts have been directed by statutory requirements in 33 states, by legislative resolution in 5 states, by building codes in 2 states, and by executive order in 3 states.* In the remaining seven states some progress in barrier elimination has been made as a result of administrative decisions by those involved in the planning and construction of public buildings and facilities.

*In a number of the 33 states which have enacted legislation relative to architectural barriers, state regulatory agencies have been directed to promulgate rules and regulations which were subsequently incorporated into building or other codes.

(2) The "American Standard Specifications for Making Buildings and Facilities Accessible to, and Usable by, the Physically Handicapped" is the basis for laws and regulations in a majority of states. The Specifications were adopted in toto in 6 states and by reference in 8 states; an additional 15 states used the Specifications in part as the basis for their state laws or regulations. Two other states have recommended utilization of the ASA Specifications in their legislative resolutions.

The successful implementation of state laws and regulations relative to architectural barriers depends on a conviction of their value, financial and administrative support by state legislatures and officials, and the development of systematic, centralized enforcement procedures, such as adoption of the law into the state building code.

A great deal more needs to be done to encourage an increased awareness of the needs of the physically handicapped in gaining access to and utilizing public facilities on the part of those who direct, supervise, or influence the planning and building of public buildings and facilities.

(3) Based on a National Survey of Public Attitudes Toward Architectural Barriers, the majority of the people in the country are not particularly concerned about the problem of architectural barriers to

than any other groups.

Assuming the survey sample was truly representati
of the U.S. population as a whole, about 18 perce
of the people in this country are directly affected
the problem of architectural barriers. Seven perce
of these are themselves physically handicapped ar
an additional 11 percent have handicapped persons
their families.

Potential public support for the institution of ba
rier elimination programs appears relatively hig
Approximately 58 percent of the people interview
considered barriers a very serious or fairly serio
problem. About 63 percent of the respondents fe
that their community should do more than is now b
ing done to overcome the physical obstacles to t
handicapped; and about 73 percent of those inte
viewed said that they would approve of the use
tax money for the elimination of architectural ba
riers.

*(4) Based on Mail Surveys Relative to Archite
tural Barriers:

A. Local Government Efforts. Local gover
ments have made only limited progress toward th
elimination of architectural barriers in buildings a
facilities open to, and used by, the public. In re
ponse to questionnaires sent to 379 cities and tow
and to 272 counties, only 95 cities and 42 counti
reported local efforts to eliminate barriers.

The need for the elimination of architectur
barriers has not been clearly demonstrated to a ve
substantial number of officials of political subdiv
sions. Lack of apparent need is the reason given
approximately 40 percent of the city officials and
approximately 30 percent of the county officia
for the absence of programs designed to make pub
buildings accessible to, and usable by, the physica
handicapped.

"Absence of a legal requirement" was the s
cond most frequently given reason for the lack of
barrier elimination program, and enactment of sta
legislation was considered by city and county of
cials as one of the best means for making publi
buildings accessible to, and usable by, the hand
capped.

Municipal ordinances and state laws relative
the elimination of architectural barriers appear to
of only limited effectiveness. They generally app
only to new, publicly owned buildings; tend to

onsidered, ineffectiveness is attributed to the ab-
ence of mandatory provisions.

. B. Professional Trade and Facility Operator
rganizations: Architects generally appear to be un-
miliar with the "American Standard Specifications"
or Making Buildings and Facilities Accessible to, and
sable By, the Physically Handicapped." Although
11 of the 709 architects responding to the ques-
onnaire stated they had designed building in which
bstacles to the functionally limited had been elimi-
ated in the design stage, only 251 architects ac-
nowledged that they were acquainted with the ASA
pecifications, and only 143 indicated they had con-
ormed to those Specifications in their design.

Legislation is the most controversial aspect of
he architectural barriers problem. The majority of
rchitects and special interest groups recognize the so-
ial desirability of legislation that would eliminate
rchitectural barriers to the handicapped. However,
hese groups indicated deep concern that such legis-
ation might increase costs appreciably, inhibit crea-
ivity, or be unnecessarily restrictive. Their support
r opposition to such legislation would be contingent
pon these factors.

*C. Handicapped Interest Groups: Handicapped
nterest groups have not been as prominent in the ar-
hitectural barrier elimination, which is only one fa-
et of the comprehensive programs most of these
roups are promoting. Emphasis on other items with
igher priorities has precluded increased efforts in
romoting a barrier elimination program.

Most of the efforts made in connection with
arrier elimination appear to have been directed in-
ward. The problem has been the subject of discus-
ion within handicapped groups, it has been featured
t meetings and conferences, and information has
been disseminated to local groups and chapters. More
emphasis should be placed on contacting outside
groups (governmental, social, business) with regard
o this problem.

Virtually all handicapped interest groups are in
avor of architectural barriers legislation, but, as sev-
eral pointed out, mere enactment of laws is not the
inal answer. Constant vigilance would still be neces-
ary in order to assure compliance.

(5) Findings Based on an Analysis of Costs In-
volved in the Construction of Barrier-Free Buildings

tributable to the installation of an elevator for th
specific purpose of making buildings and facilities a
cessible to, and usable by, the handicapped may b
relatively few in number. Today, much new buildi
construction is either single story, and does not r
quire elevator installation for accessibility, or is in e
cess of three stories, and elevator costs should be co
sidered a necessary component of conventional co
struction costs.

*(6) Summary

Elimination of architectural barriers must
necessity be a long term program. Substantial mo
fication of the urban environment to facilitate t
movement of the physically handicapped cannot
achieved overnight. Elimination of barriers can be
complished only as new buildings are constructed
old buildings are remodeled.

Major impetus to local efforts to eliminate
chitectural barriers to the physically handicapped h
been provided by public and private health and w
fare agencies and organizations, particularly tho
that represent or are mainly concerned with proble
of the handicapped, and by private individuals. Fo
most among these groups are the local committe
for employment of the handicapped and societies
crippled children and adults.

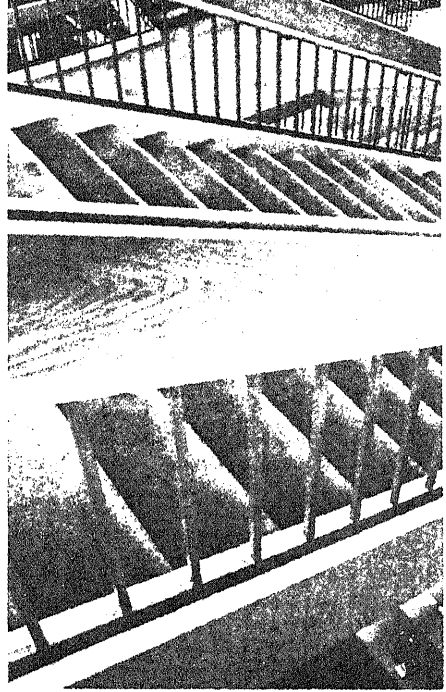
The great majority of local and state laws a
regulations relative to architectural barriers app
solely to governmental buildings and facilities. Su
structures, although of primary importance for t
maintenance of community health, education a
welfare, are not places in which large numbers
physically handicapped individuals can find emplo
ment and thus make a useful contribution to socie
The great majority of the buildings in which emplo
ment opportunities exist are privately owned in c
society. As a consequence, increased effort must
made to secure the cooperation and support of t
business community, which to date has given lit
support in most areas.



BARRIER-FREE DESIGN FOR THE DISABLED

PRODUCED BY THE WASHINGTON/ALASKA REGIONAL MEDICAL PROGRAM

IN COOPERATION WITH THE EASTER SEAL SOCIETY FOR CRIPPLED CHILDREN AND ADULTS OF WASHINGTON



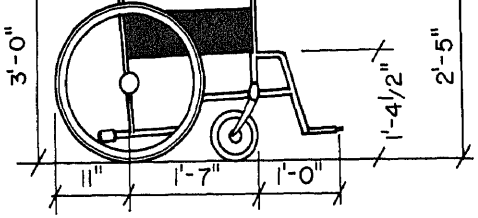
THE PROBLEM

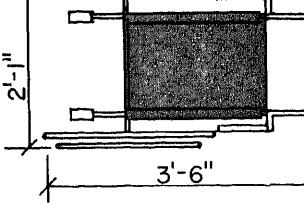
Few able-bodied persons recognize or appreciate the architectural problems encountered every day by those who are physically handicapped. The aggravations and frustrations presented by architectural barriers in public buildings, offices and homes are numerous and largely unnecessary. Rehabilitation efforts are thwarted. The disabled, as well as the elderly who also suffer certain physical limitations, are often prevented from participating as contributing and productive members of their society because of these barriers.

Some efforts have been made towards the elimination of such barriers. Standards have been set and legislation passed. Barrier-free design is growing. The question remains—is the real need well enough recognized and understood even by those attempting to implement these standards? Designs are frequently piecemeal and token efforts fail to provide maximal use. For instance, a ramp approach is built for a too-narrow doorway, or a curb is placed between the parking area and an otherwise accessible building. Often so-called "accessible" restroom facilities in no way properly accommodate the severely and permanently disabled wheelchair users —who need them most.

Certainly there is a large segment of society, the disabled and the elderly, who could be included in—rather than excluded from—community life. By 1985 it is predicted that the physically disabled may total more than 40 million and returning soldiers will be among them. Even today one out of every 10 persons

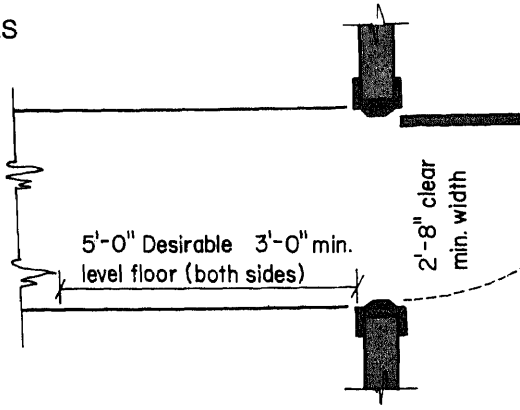
Architects have been among the first to begin to make remedial efforts on behalf of the handicapped. But the problem is not theirs alone. It rests with all who are in a position to effect a change. Builders, contractors, legislators, city and state planners and even the general public, all can help. Architects can continue to lead in designing buildings and structures that will serve as large a portion of society as possible, not just the physically fit. They can work toward changing building codes to include American Standards Associations specifications on architectural barriers and see that they are incorporated in their designs. Contractors can work with architects in being certain that American Standards Association specifications are observed. State and City officials can be alerted to the needs of the disabled and see that existing and new legislation is enforced. The general public can become more appreciative of the needs of the disabled and supportive of the efforts toward barrier-free design.





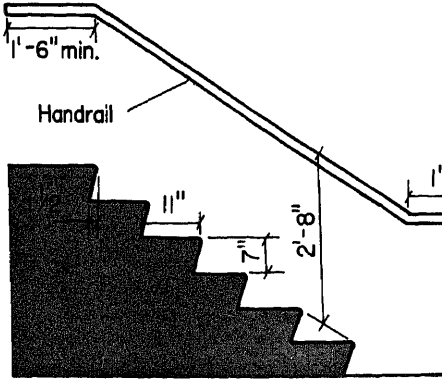
2 DOORS AND ENTRIES

All doors should be a *minimum* of 2'8" wide with door open to 90%. Sills should be flush with the doorway. Door pressure should not exceed eight pounds. The floors on either side of the doorway should be level for at least 5'. Outer and inner doorways less than 6'6" apart are difficult for the disabled to manage. Revolving doors are impossible for those in wheelchairs. Every building should have at least one level entry, accessible to elevators.

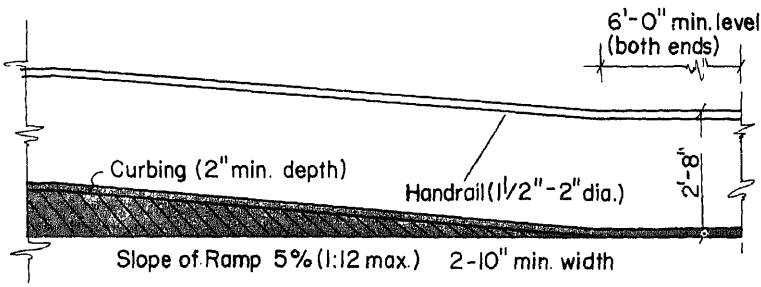


3 STAIRS AND HANDRAILS

Projecting nosings and open risers on stairs are undesirable, since toes tend to catch on them. Risers should not exceed 7" in height. Nosings should be flush with the risers. Handrails should be 2'-8" high and extend 1'-6" or more beyond the top and bottom steps.

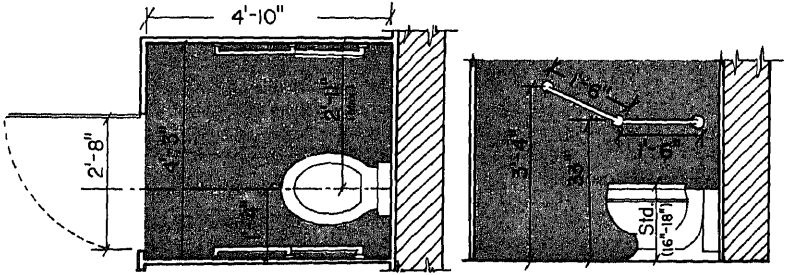


the ramps with at least 5' straight, level clearance at the bottom. Curbs, or at least one handrail, should be provided.



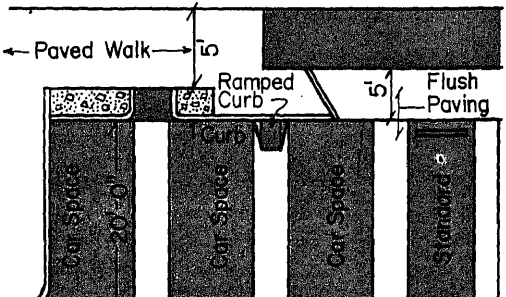
5 RESTROOMS

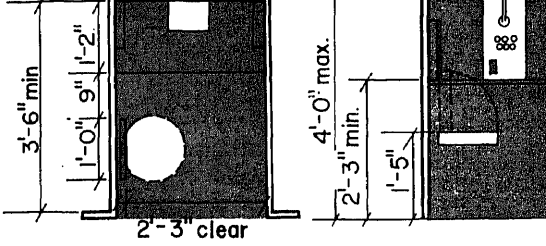
At least one stall in each major restroom should be wide enough to accommodate a wheelchair inside it (with the door closed) and this stall should have enough space in it to allow a *lateral* transfer from wheelchair to toilet. Otherwise the severely disabled person in a wheelchair will be unable to use it. Mirrors, towel dispensers and shelves should be placed low enough for the wheelchair user. These restrooms should be marked with the *Symbol of Access*.

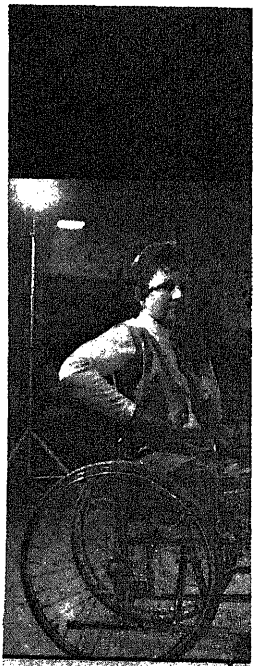


6 PARKING

Parking spaces, marked for the use of the handicapped, should be provided near building entrances to eliminate wheeling or walking behind parking cars. Parking spaces should have level (no curbs or stairs) access from the parking area to the building entrance.







Barbara Allan



Mariann Soulek

THE FILM "THE SUREST TEST"

"The surest test of a civilization . . . is to be found i
its architecture."
William Hickling Prescott, historian (1796-1859)

Barbara Allan, who describes herself as a membe
of "the wheelchair set," conceived the idea of the
film "The Surest Test", and wrote the booklet as a
of encouraging barrier-free design. She received
her B.F.A. degree in Graphic Design at the
University of Washington in June, 1972.

The leading role in the film is played by Mariann
Soulek, also confined to a wheelchair. She is assi
professor in Recreation and Park Administration
Eastern Washington State College.

John Wittwer, Seattle, composed the original s

The film was funded by the Washington/Alaska
Regional Medical Program, an agency of the U.S.
Department of Health, Education and Welfare, wh
assists local health professionals and laymen in
improving health care. It was produced and direc
by Alan Rhone, a member of the Regional Medica
Program staff.

Prints of the film are available on loan and
additional copies of the booklet may be obtained
through:

EASTER SEAL SOCIETY FOR CRIPPLED
CHILDREN AND ADULTS OF WASHINGTON
521 2nd Ave. W./AT 4-5707/SEATTLE, WA
W. 510 2nd Ave./TE 8-8353/SPOKANE, WA

RMP

Information-Education Resource Supp
WASHINGTON/ALASKA REGIONAL
PROGRAM
530 "U" District Building, Seattle, WA


BARRIER FREE DESIGN GRAPHICS

GRAPHIC ILLUSTRATIONS

OF

MICHIGAN

CONSTRUCTION CODE COMMISSION

"GENERAL RULES"

APPLICABLE TO

MAKING FACILITIES ACCESSIBLE

FOR USE BY THE PHYSICALLY HANDICAPPED

AND AGED

BY

ROBERT A. L. WILLIAMS, A.I.A.

FOR

THE MICHIGAN COMMISSION ON EMPLOYMENT OF THE HANDICAPPED

COMMITTEE FOR A BARRIER FREE ENVIRONMENT

MICHIGAN DEPARTMENT OF LABOR

This publication has been printed by handicapped persons in a sheltered workshop at the League for the Handicapped-Goodwill Industries, in cooperation with the Michigan Commission on Employment of the Handicapped. Order form on last page.

LEAGUE PRESIDENT - RUSSELL ALBRECHT

COMMISSION CHAIRMAN - JUDD PERKINS

About the Author

Robert A. L. Williams, A.I.A. is an architect who also teaches Barrier Free Design at Lawrence Institute of Technology in Southfield, Michigan. In 1973 he served on the B.O.C.A. Ad Hoc Committee on Article 6 and while serving on that committee authored the B.O.C.A. Barrier Free Design rules which were later adopted for inclusion in the 1975 B.O.C.A. Code. These rules were revised by the Michigan Construction Code Commission for inclusion in their "General Rules." Other contributions to the field of Barrier Free Design include building elevation forms and a catalogue of available equipment meeting general Barrier Free Design requirements.

Miriam Frances King

March 1975

Chairperson, Committee for a Barrier Free Environment, Michigan Commission on Employment of the Handicapped

Acknowledgments

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of the Handicapped Committee on a Barrier Free Environment and the Michig
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Rules."

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First Printing, March 1975

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Appendix A: Design Reference Dimensions

Wheel Chairs
Reach Dimensions for Chair-Bound People
180° and 360° Turns

Appendix B: Other Current Michigan Legislation and Promulgated Standards Relative to Making Facilities Accessible for Use by the Physically Handicapped and Aged

---Act No. 8, Public Acts of 1973 (Path Ramp Bill)

---Sidewalk Ramp Details, State of Michigan, Department of Highways and Transportation

---Act No. 180, Public Acts of 1974 (Construction Code Commission Amendments to P.A. 230 of 1972)

---Act No. 190, Public Acts of 1974

---Michigan Department of Labor, Elevator Safety Board (Standards for Elevators and Wheelchair Elevating Devices)

PREFACE

The following is a copy of the Michigan Department of Labor, Construction Code Commission's "General Rules," applicable to making facilities accessible for use by the physically handicapped and the aged. (Only those provisions of the "General Rules" applicable to Barrier Free Design have been reprinted.)

These "General Rules" have been reprinted section by section, and interpretative graphics have been provided. The graphics provided are not intended to duplicate all the information printed in the code wording, but only to assist in clarifying the intent. The graphics shown are not indicating the only method or methods of complying with the rules, but are showing examples of methods which may be used to comply with the General Rules. Graphics should not be used without reading the associated copy from the Construction Code Commission Rules.

Do not scale any drawings.

Those dimensions marked with an asterisk (*) are author recommendations and are not a part of the rules of the Construction Code Commission.

Where the abbreviations "min" and "max" are used, "min" refers to minimum, and "max" to maximum.

In some sketches, the terms "min" or "max" have been added in parentheses to editorially clarify the intent of the Code.

The sections boxed-in are reprinted directly from the Construction Code Commission "General Rules."

* = AUTHOR'S RECOMMENDATIONS
(not a Code requirement)

R 408.30427. Accessibility for use by the physically handicapped and aged.

Rule 427. Section 318 of the code is added as follows:

318.0. Provisions for Barrier Free Design. This section applies to all levels and areas used by the general public, employees, persons visiting or on the premises for any reason and to all use groups except L-3 and M. Areas of a building or structure such as mechanical equipment rooms, machine rooms and penthouses housing equipment may be excluded from the requirements.

FROM THE BASIC CODE:

L-3 "USE GROUP L-3 STRUCTURES SHALL INCLUDE ALL BUILDINGS ARRANGED FOR THE USE OF ONE- OR TWO-FAMILY DWELLING UNITS INCLUDING NOT MORE THAN FIVE (5) LODGERS OR BOARDERS PER FAMILY."

M "USE GROUP M, MISCELLANEOUS USES. STRUCTURES AND BUILDINGS OF A TEMPORARY CHARACTER AND MISCELLANEOUS STRUCTURES NOT CLASSIFIED IN ANY SPECIFIC USE GROUP SHALL BE CONSTRUCTED, EQUIPPED AND MAINTAINED TO MEET THE REQUIREMENTS OF THE BASIC CODE COMMENSURATE WITH THE FIRE AND LIFE HAZARD INCIDENTAL TO THEIR USE. MISCELLANEOUS USES SHALL INCLUDE ALL ACCESSORY BUILDINGS AND STRUCTURES USED AS PRIVATE GARAGES, SHEDS, FENCES AND SIMILAR PURPOSES."

Buildings and structures and facilities within buildings and structures meeting the requirements for barrier free design, shall be clearly identified with the international symbol of accessibility for the handicapped.



THE INTERNATIONAL SYMBOL OF ACCESSIBILITY FOR THE HANDICAPPED IS ISSUED BY THE MICHIGAN COMMISSION ON EMPLOYMENT OF THE HANDICAPPED. DECALS ARE ISSUED WHICH ARE TO BE PLACED AT ACCESSIBLE ENTRIES AND ON DOORS TO ACCESSIBLE TOILET ROOMS & OTHER FACILITIES WITHIN THE BUILDING. AFTER RECEIPT OF THE SYMBOL, IT MAY BE USED IN BUSINESS ADVERTISING ETC. WHICH

bedroom units or fraction thereof in use group L-1 buildings shall be made accessible to physically handicapped persons. The bedroom units allocated for the physically handicapped shall be proportionately distributed throughout the range of size and price of the total bedroom units.

FROM THE BASIC CODE:

L-1 "USE GROUP L-1 STRUCTURES SHALL INCLUDE ALL HOTEL BUILDINGS, LODGING HOUSES, BOARDING HOUSES AND DORMITORY BUILDINGS ARRANGED FOR THE SHELTER AND SLEEPING ACCOMMODATION OF MORE THAN TWENTY (20) INDIVIDUALS."

318.12. Use Group L-2. In addition to multiple dwellings in this use group, the requirements for barrier free design shall apply to complexes and group housing. The requirements shall not apply to dormitories, lodging houses and boarding houses having accommodations for less than 20 individuals. At least 1 dwelling unit for every 25 dwelling units shall be allocated for physically handicapped persons and shall be proportionately distributed throughout the ranges of sizes of the total dwelling units.

FROM THE BASIC CODE:
(EXCLUDING ABOVE STATED EXCEPTIONS)

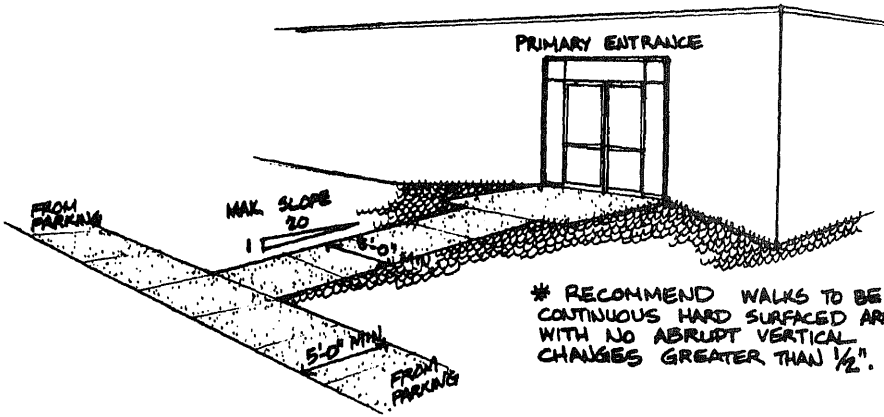
L-2 "USE GROUP L-2 STRUCTURES SHALL INCLUDE ALL MULTIPLE-FAMILY DWELLINGS HAVING MORE THAN TWO DWELLING UNITS"

AMENDMENT:

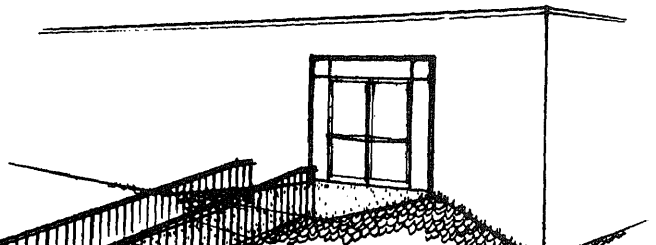
ON NOV. 22, 1974 EMERGENCY RULES OF THE MICHIGAN CONSTRUCTION CODE COMMISSION AMENDED THE ABOVE SECTION 318.12 SO THE LAST SENTENCE READS:

"AT LEAST 1 DWELLING UNIT FOR EVERY 25 DWELLING UNITS OR FRACTION THEREOF SHALL BE MADE ACCESSIBLE TO AND USABLE BY PHYSICALLY HANDICAPPED PERSONS AND SHALL BE PROPORTIONATELY DISTRIBUTED THROUGHOUT THE RANGES OF SIZES OF THE TOTAL DWELLING UNITS."

318.2. Building Approaches. At least 1 primary entrance at a grade floor level of a building or structure shall be accessible by means of a walk uninterrupted by steps or abrupt changes in levels and with a width of not less than 5 feet and a gradient of not more than 1 foot in 20 feet.

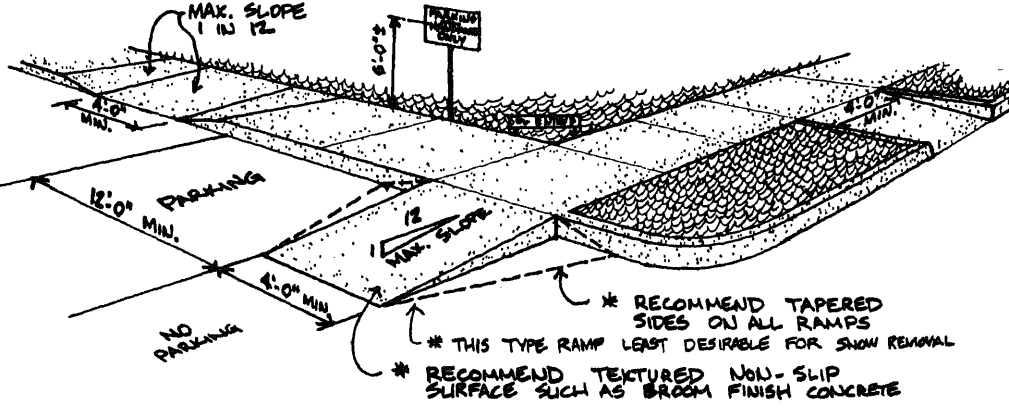


When practical difficulties are involved for carrying out this section the gradient may be changed but not to exceed the requirements for ramps. In this case the walk shall comply with all of the requirements for ramps in Sections 617.1, 617.2, and 617.3.



not less than 12 feet wide. Where a curb exists between a parking lot surface and a sidewalk surface, an inclined approach or a curb cut with a gradient of not more than 1 foot in 12 feet and a width of not less than 4 feet shall be provided for wheelchair access. Parking spaces for the physically handicapped shall be located as close as possible to walkways and entrances. Signs shall be provided when necessary indicating the direction of travel to an accessible entrance.

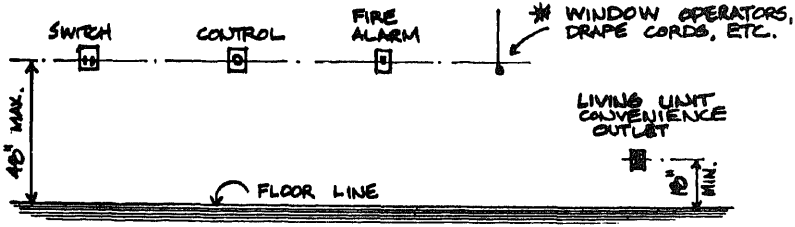
Total Parking in Lot	Required Number of Accessible Spaces
Up to 25	1
26 to 50	2
51 to 75	3
76 to 100	4
101 to 150	5
151 to 200	6
201 to 300	7
301 to 400	8
401 to 500	9
501 to 1000	2% of total
Over 1,000	20 plus 1 for each 100 over 1,000



* REFER TO APPENDIX 'B' - "SIDEWALK RAMP DETAILS, STATE OF MICHIGAN, DEPT. OF HIGHWAYS & TRANSPORTATION" FOR FURTHER DETAILS.
* REFER TO APPENDIX 'B' - "PUBLIC ACT NO. 8, OF 1973" (PATH RAMP BILL) FOR A COMPLETE DESCRIPTION OF OTHER ON-SITE & OFF-SITE LOCATIONS WHERE CURB CUTS ARE REQ'D.

passageways, corridors and doorways meeting the requirements of Sections 612, 614 and 627. In L-2 structures laundry and storage facilities shall be accessible from the handicapped units.

318.5. Access to Electrical Switches, Controls, Fire Alarms and Convenience Outlets. Light switches, controls and fire alarms shall be located not more than 48 inches above the floor. Convenience outlets located within living units shall be located not less than 18 inches above the floor.

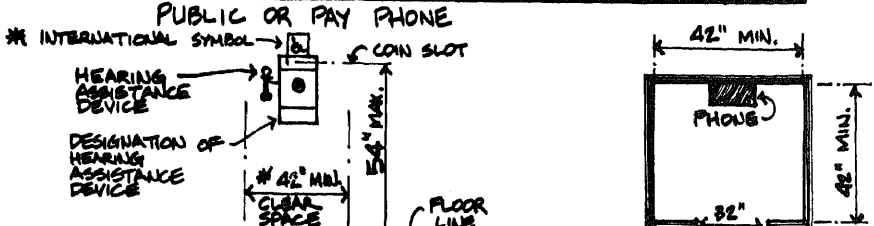


318.51. Where a public or pay phone is installed, the following shall apply:

(a) Five percent or not less than 1 telephone shall be accessible to, and usable by, physically handicapped persons.

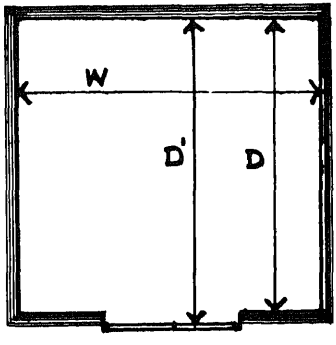
(b) The telephones shall have the coin slot not more than 54" above the floor.

(c) Telephones shall be equipped to assist persons with a hearing disability and so designated.



318.6. Elevators. Elevators that are installed in multi-story buildings in order to provide interior access for the physically handicapped individuals shall meet the following requirements:

(a) The elevator cab shall have a clear area of not less than 25 square feet with a minimum dimension of 55 inches. Elevators serving not more than 3 stops may have a clear area of 22 square feet with minimum dimensions of 48 inches from rear cab wall to inside face of car doors.



3 STOPS OR LESS

W x D = 22 SQ. FT. MIN.
D' = 48" MIN.

4 STOPS OR MORE

W x D = 25 SQ. FT. MIN.
W = 55" MIN.
D = 55" MIN.

ELEVATOR PLAN

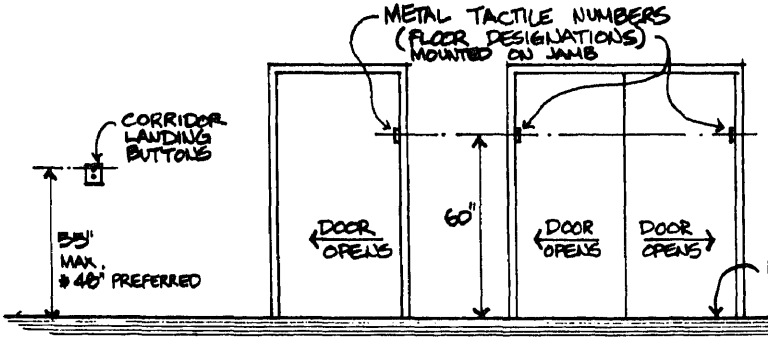
(b) The elevator door shall have a minimum clear opening width of 36 inches.

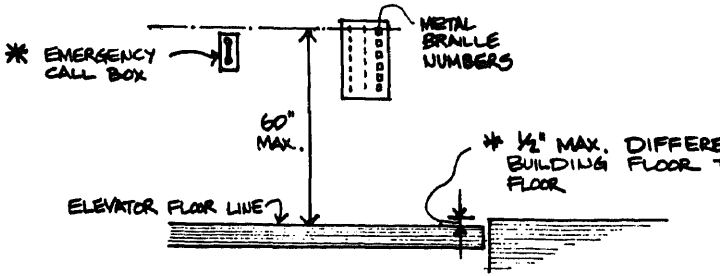


(c) The corridor landing buttons shall be located not more than 55 inches above the floor.

(d) Metal braille numbers shall be provided adjacent to cab control buttons and switches and located not more than 60 inches above the floor.

(e) Metal tactile numbers shall be provided for floor designation on each floor, 60 inches above the floor, on the fixed point at the open side of the elevator door or on both sides when center opening doors are used.



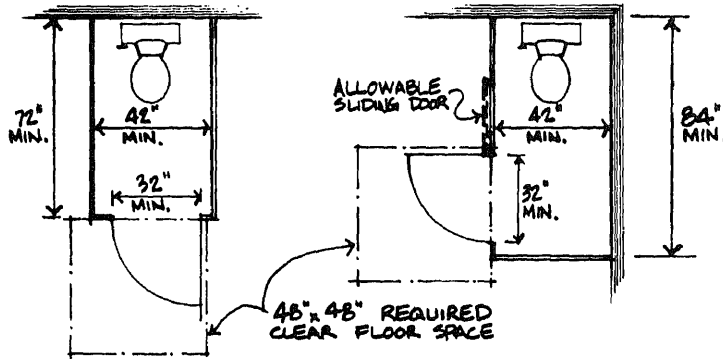


(f) At least 1 handrail shall be provided and located at normal handrail height within the elevator car.

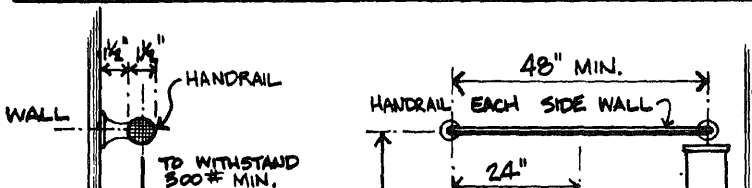
(g) Elevator doors shall operate automatically and the leading edge of car doors shall be equipped with door safety shoe reversing device and light ray door reversing device or other type proximity sensing reversing device.

318.7. Access to Plumbing Fixtures and Kitchens. All toilet rooms with group facilities shall meet the requirements of Sections 318.71, 318.72, 318.73, 318.74 and 318.75. Other toilet rooms shall meet the requirements of Sections 318.72, 318.73, 318.74, 318.75, 318.76 and subdivisions (a), (d) and (e) of Section 318.78. In all required toilet rooms a minimum of 2% of toilet fixtures but not less than 1 fixture of each type shall meet these requirements.

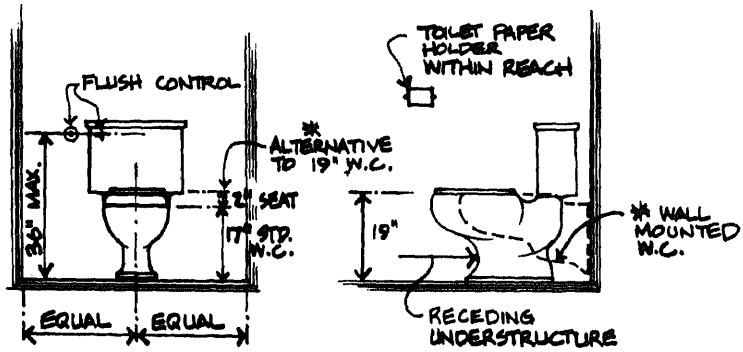
318.71. (1) Where water closet stalls are provided, stalls for physically handicapped persons shall be not less than 42 inches wide by 72 inches deep. If the stall has a door it shall swing out or slide and provide a clear opening of not less than 32 inches. When it is necessary to install the opening on the side instead of the front of the stall, the depth of the stall shall be a minimum of 84 inches. There shall be a minimum clear floor space of 48 inches by 48 inches in the front of the stall opening.



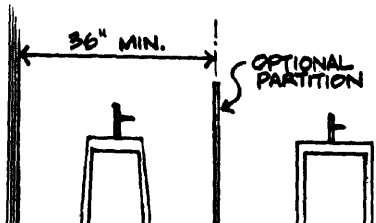
(2) Handrails shall be provided on each stall side wall. Handrails shall be not less than 48 inches long and 33 inches above and parallel to the floor with the front end position 24 inches in front of the water closet. Each handrail shall be 1 1/2 inches outside diameter with 1 1/2 inch clearance between rail and wall, and anchored so as to withstand a force of 300 pounds.



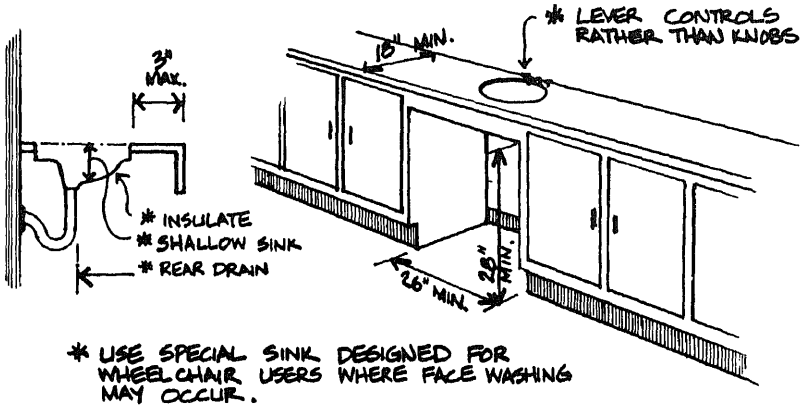
318.72. At least 1 water closet shall have a narrow understructure that recedes sharply from the front and is centered at the rear wall with the seat 19 inches above the finished floor. The trap shall not extend in front of or be flush with the lip of the bowl. The flush control shall be mounted no higher than 36 inches above the floor. The toilet paper holder shall be mounted within arm's reach of person using the water closet and shall not impede operation of the wheelchair.



318.73. When urinals are provided, there shall be at least 1 wall mounted urinal with the opening of the lip a maximum of 15 inches above the finished floor or shall be floor mounted and level with the finished floor. Urinal shields shall not extend beyond the lip. If the urinal is enclosed in a stall the width of the stall shall be a minimum of 36 inches and meet the depth and opening requirements of subsection (1) of section 318.71.

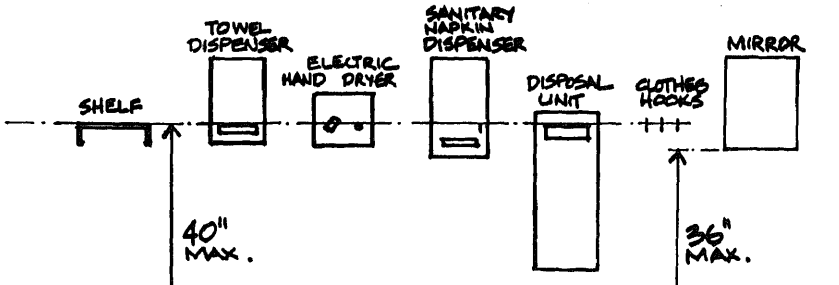


318.74. There shall be at least 1 lavatory that projects a minimum of 18 inches from the wall, is wall mounted with the bottom edge at least 28 inches above the finished floor and with an opening at least 26 inches wide. Maximum water temperature to outlets shall not exceed 120°F. Faucets shall be lever or push button type. When mounted in a counter, the rim shall be not more than 3 inches from the front.



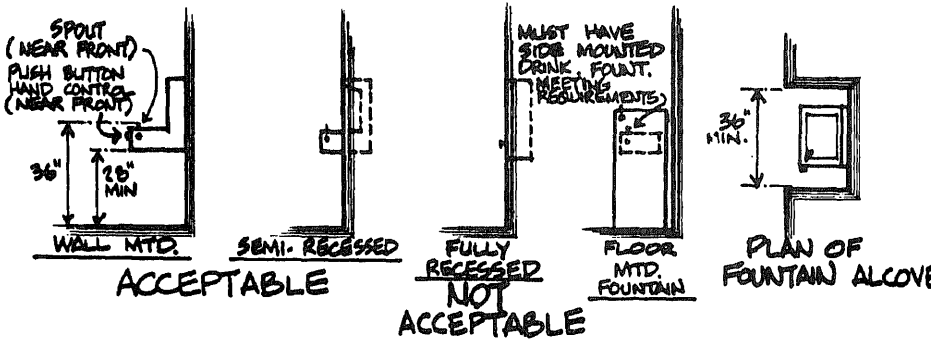
* USE SPECIAL SINK DESIGNED FOR WHEELCHAIR USERS WHERE FACE WASHING MAY OCCUR.

318.75. Toilet room accessories, such as shelf, towel dispenser, electric hand dryer, sanitary napkin dispenser, disposal unit and clothes hook shall be mounted so that the bottom edge is no higher than 40 inches above the floor. The towel dispenser shall be mounted within arms reach of a handicapped individual seated in a wheelchair in front of the lavatory. At least 1 mirror shall be full length or shall be mounted with the lower edge no more than 36 inches above the floor.



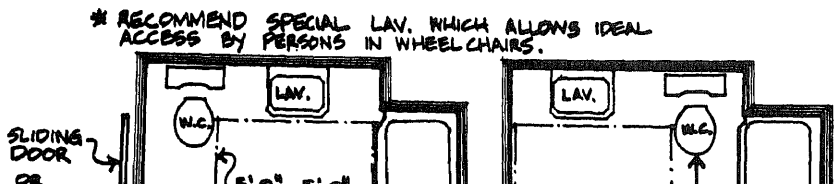
318.76. Handrails, water closets, lavatories and accessories for small children, such as elementary school children, shall meet the requirements for their use.

318.77. Drinking fountains or other water dispensing means shall be accessible to and usable by handicapped persons. Drinking fountains shall be wall mounted or semi recessed; fully recessed are not acceptable. If a drinking fountain is set in an alcove, the width of the recess shall be at least 3 feet. Drinking fountains shall have the bottom edge of the apron at least 28 inches above the finished floor, be mounted with an upper edge of the fountain base 36 inches above the floor and be hand operated with spout and controls at the front. The controls shall be push button or lever type. A floor mounted drinking fountain shall have a side mounted fountain meeting the above requirements.

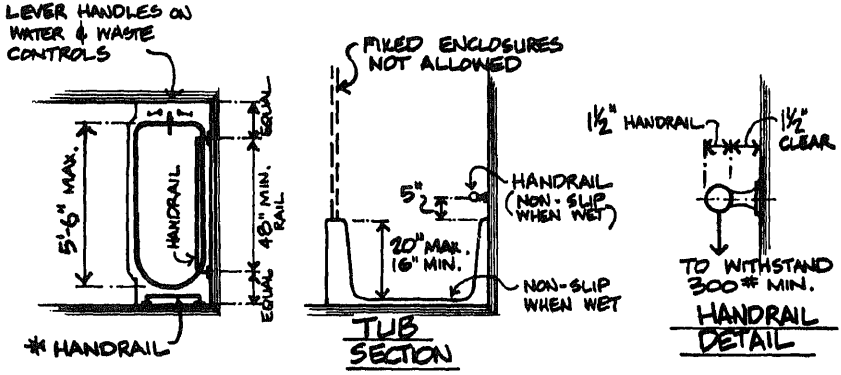


318.78. Bathroom for Group L-1 and L-2 structures. Each unit designated for the physically handicapped as specified in sections 318.11 and 318.12 shall contain 1 bathroom that complies with the following requirements:

(a) A minimum of 5 feet by 5 feet clear floor space shall be provided. When the fixtures and controls of the bathtub, water closet and lavatory, in that order, are located on the same wall, the clear space from the front of the water closet to the opposite wall may be reduced to 4 feet. The entrance door shall open out or slide with a minimum clear opening of 32 inches.

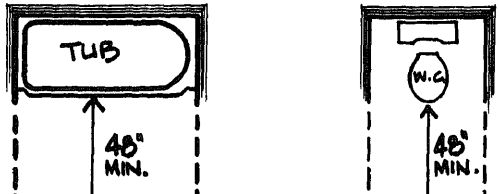


(b) Bathtub water and waste controls shall have lever handles. Maximum water termperatures to water outlets shall not exceed 120°F. The bathtub rim shall be no higher than 20 inches nor no lower than 16 inches and the interior length shall not exceed 5 feet 6 inches. A handrail, at least 48 inches long, 5 inches above the rim and centered on the back wall, shall be 1 1/2 inches in outside diameter with 1 1/2 inches clearance between rail and wall and fastened at ends and center so as to withstand a force of 300 pounds. Handrail and floor of the tub shall be nonslip when wet. Fixed tub enclosures are not allowed.

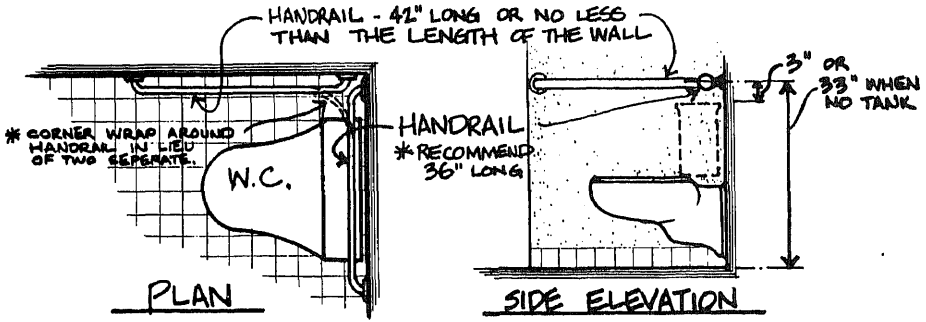


(c) A duplex electrical receptacle shall be provided within easy reach of a person seated in a wheelchair in front of the lavatory. The water closet, lavatory and accessories shall otherwise conform to sections 318.72, 318.74 and 318.75.

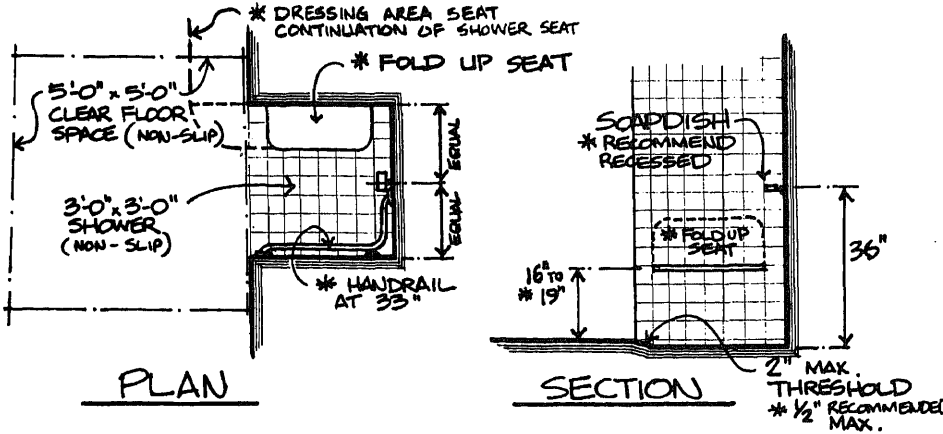
(d) When bathtub or water closet are in a separate room from the lavatory, the clear space between the front edge of the fixtures and the opposite wall shall be no less than 48 inches.



wall space, if there is one, that is 42 inches long or no less than the wall length, and 1 handrail shall be placed on the wall behind the water closet 3 inches above the tank top or 33 inches above the finished floor for water closets without tanks. The design of handrails shall meet the requirements of subsection (2) of section 318.71.



(f) Where showers only are provided, the shower cubicle shall measure 3 feet by 3 feet inside dimensions. The threshold shall be no higher than 2 inches. The soap dish shall be mounted on the back wall and centered at 36 inches above the floor. The floor inside and outside the cubicle shall have a nonslip surface when wet. There shall be a clear floor space of at least 5 feet by 5 feet outside of the cubicle.

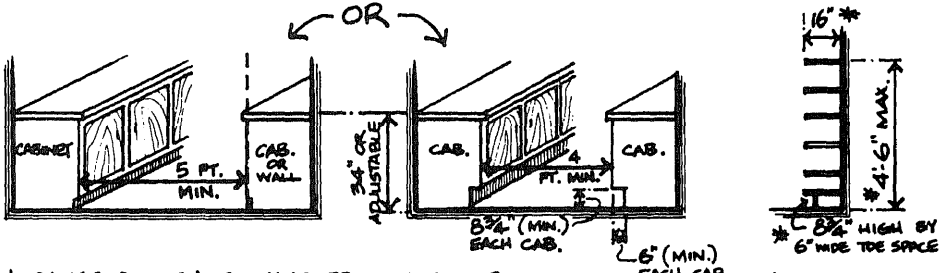


* USE SHOWER HEAD WITH HAND HELD SHAMPOO TYPE HEAD.
* USE LEVER HANDLE CONTROLS RATHER THAN KNOBS.

318.79. Kitchens for Group L-1 and L-2 structures. Each unit containing kitchens, and designated for physically handicapped as specified in sections 318.11 and 318.12, shall contain 1 kitchen that shall comply or be adjustable to comply with the following requirements:

(a) A minimum of 5 feet clear floor space shall be provided between opposite cabinets or cabinets and walls; except where a toe space of 8 3/4 inches high by 6 inches deep is provided on each side, the clear space may be reduced to 4 feet.

(b) Counter height shall be 34 inches if fixed, or may be adjustable.

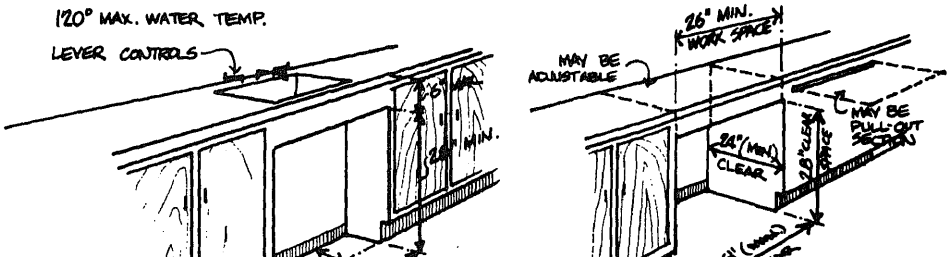


* RANGE & OVEN TO HAVE FRONT CONTROLS
* TOP OF OVEN AT 52" MAX.
* MOUNT VENT HOOD CONTROLS AT 48" MAX. (SEE SECTION 318.5)

* RECOMMENDED CUPBOARD SECTION

(c) The sink shall be a maximum of 6 inches in depth with lever type controls. There shall be a space at least 28 inches above the finished floor, 26 inches wide and 12 inches deep under the sink. Maximum water temperatures to water outlets shall not exceed 120°F.

(d) A work space shall be provided that is at least 26 inches wide, has a clear opening 26 inches wide, 28 inches high and 24 inches deep. This work space may be provided by an adjustable counter or pull out sections.

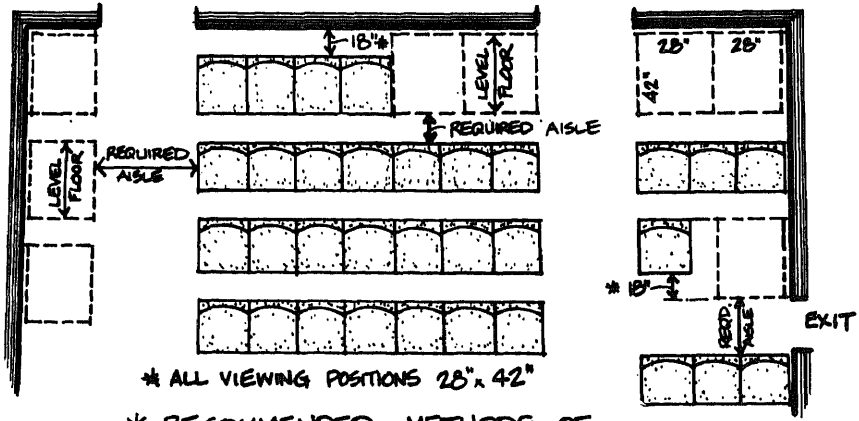


Capacity of Assembly Space	Viewing Positions
Up to 25	1
26 to 50	2
51 to 75	3
76 to 100	4
101 to 150	5
151 to 200	6
201 to 300	7
301 to 400	8
401 to 500	9
501 to 1,000	2% of total
Over 1,000	20 plus 1 for each 100 over 1,000

Viewing positions for wheelchair persons shall be provided in a reasonable and convenient section or sections of the facility by providing level clear space devoid of any fixed seating arrangements.

These positions shall be located so as not to interfere with egress from any row of seats and shall not infringe upon aisle requirements.

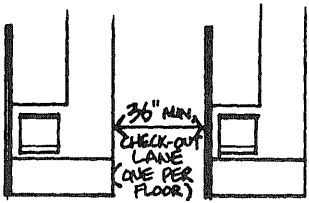
There shall be no steps in the aisles or in the access route used by the physically handicapped to reach the performance viewing positions, but the aisles may be inclined.



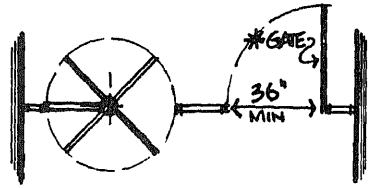
* RECOMMENDED METHODS OF PROVIDING VIEWING POSITIONS

318.9. Checkout Lanes and Turnstiles. Buildings which include checkout lanes shall provide on each floor at least 1 checkout lane which is not less than 36 inches wide.

Buildings which utilize turnstiles to control pedestrian traffic shall provide a clearly marked alternate and independent access route which is at least 36 inches wide.



CHECK-OUT LANES



TURNSTILES

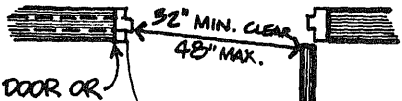
R 408.30443. Means of egress.

Rule 443. Section 614.2 is amended and sections 614.6 and 614.7 are added.

614.0. Means of Egress Doorways.

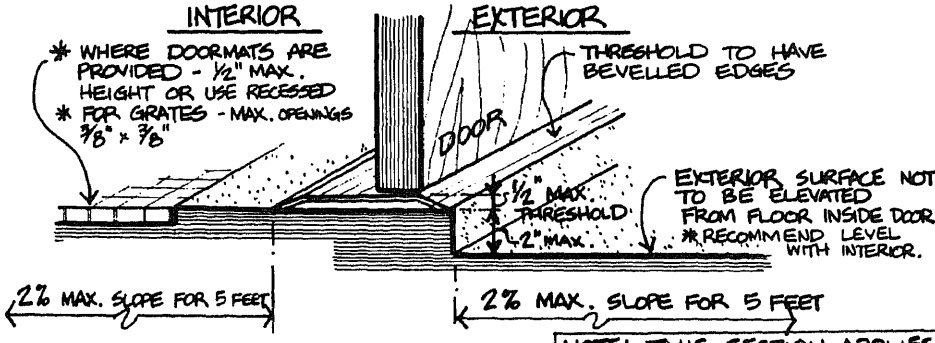
NOTE: THE FOLLOWING SUBSECTIONS OF ARTICLE 6 REFER TO ALL REQUIRED MEANS OF EGRESS, NOT ONLY THOSE WHICH ARE PROVIDING INGRESS FOR THE MOBILITY LIMITED.

614.2. Size of Doors. A single door opening shall provide a clear width of not less than 32 inches and a maximum width of 48 inches. When the doorway is divided into 2 or more separate openings, the minimum clear width of each opening shall be not less than 32 inches and each opening shall be computed separately in determining the number of required units of exit width. A door 40 inches in width shall be deemed the equivalent of 2 full units of exit width. The height of doors shall not be less than 6 feet 8 inches.





door. A threshold at a grade floor exitway shall be not more than 1/2 inch high with bevelled edges. The floor and exterior surface shall not have a grade of more than 2% for a distance of 5 feet either side of the door.

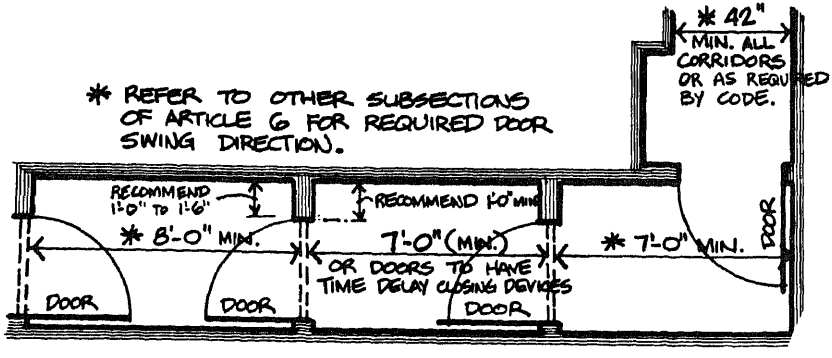


SILL SECTION

NOTE: THIS SECTION APPLIES ONLY TO EXITS, NOT TO REQUIRED ENTRANCES.

* REFER TO SECTION 318.2 FOR MORE STRINGENT REQUIREMENTS AT THE ACCESSIBLE PRIMARY ENTRANCE.

614.7. Doors in Series. Doors in series may be operated by time delay closing devices or shall be spaced apart 7 feet in a closed position to allow for use by persons in wheelchairs.



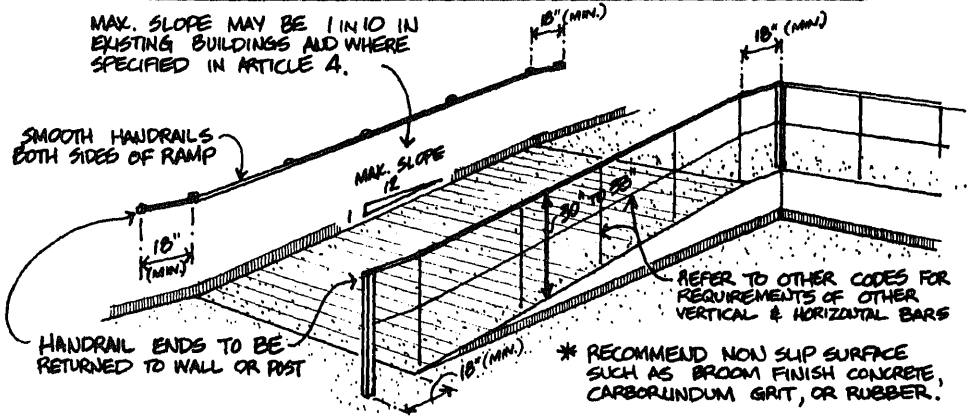
R 408.30445. Ramps.

Rule 445. Section 617.0 is amended to read as follows:

617.0. Exitway Ramps:

617.1. Ramps with a gradient of not more than 1 in 12 may be used as an exitway component and shall comply with all the applicable requirements of required interior stairways as to enclosure, capacity and limiting dimension; except in existing buildings and where specified in Article 4 for special uses and occupancies, larger gradients may be permitted but in no case greater than 1 in 10.

617.2. Handrails. Handrails shall be provided on both sides of ramps not less than 30 inches nor more than 33 inches in height, measured from the surface of the ramp. Handrails shall be smooth and shall extend 18 inches beyond the top and bottom of the ramp and return to walls or posts at the ends.



617.3. Landings. Landings shall be provided at all ramp points of turning, entrance, exiting and doors, and at a minimum of 30 foot intervals. All landings shall be of length so as to provide a minimum of 42 inches clear from any door swing to the ramp. Minimum landing length shall be 42 inches and the bottom landing of any ramp or set of ramps and landings of a straight run shall be at least 72 inches.



R 408.30446. Interior exitway stairways.

Rule 446. Section 618.51 and 618.61 are amended to read as follows:

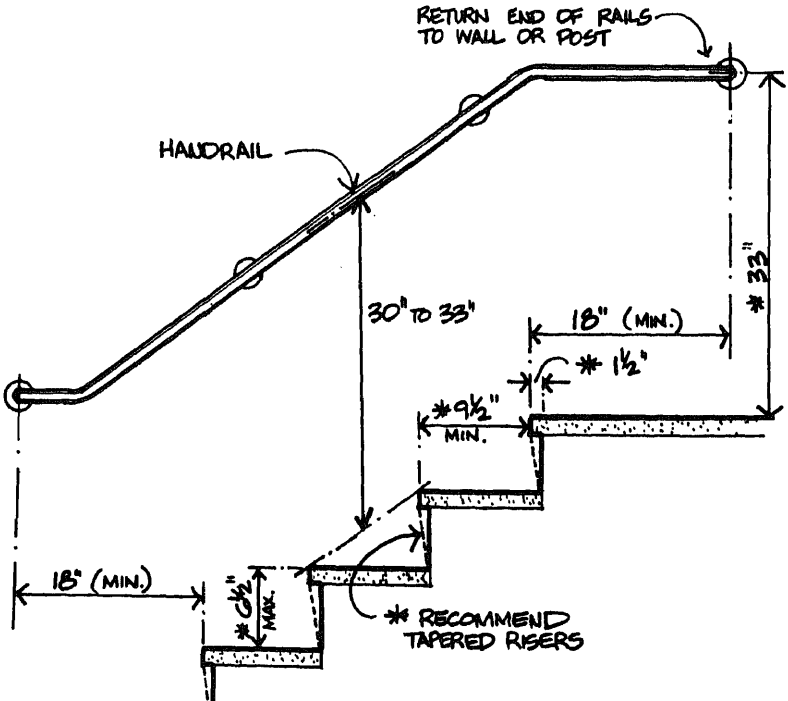
618.0. Interior Exitway Stairways:

618.51. (1) Handrails may project not more than 3 1/2 inches into the required stair width.

(2) Handrails shall be not less than 30 inches nor more than 33 inches, measured vertically, above the nosing of the treads.

(3) Handrails shall extend 18 inches beyond the top and bottom step if a guard or wall exists, and shall be returned to walls or posts at the ends of the stairways.

618.61. Width. The width of every exitway door to or from a stairway shall be not less than the number of units of exit width required for the capacity of the stairway which services the floor or area from which the exitway door leads; but not less than 32 inches clear.



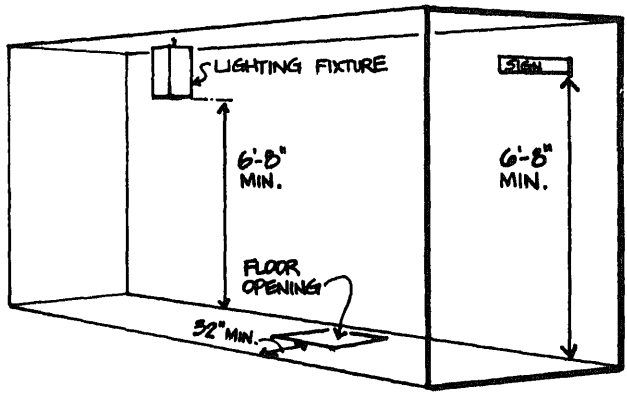
R 404.30448. Hazards in means of egress.

Rule 448. Section 627 is added as follows:

627.0. Hazards in Means of Egress:

627.1. Floor Openings. A portion of the means of egress shall not have clear width reduced to less than 32 inches by floor or walkway openings or other temporary obstructions that would allow exiting by persons confined to wheelchairs.

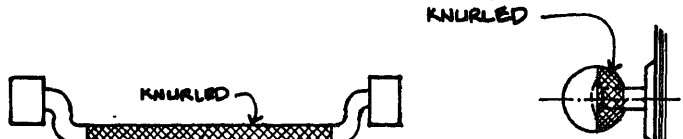
627.2. Protrusions. A projection shall not reduce the allowable headroom to less than 6 feet 8 inches in corridors, door openings or lines of egress.

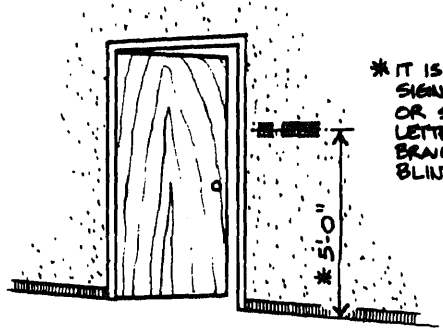


627.3. Identification of Hazardous Exits. Doors leading to dangerous areas such as fire escapes, loading platforms, switch rooms and mechanical rooms shall be equipped with knobs, handles or push bars that have been knurled.

627.4. Floor Surfaces. All floors and means of egress shall have a surface that is nonslip.

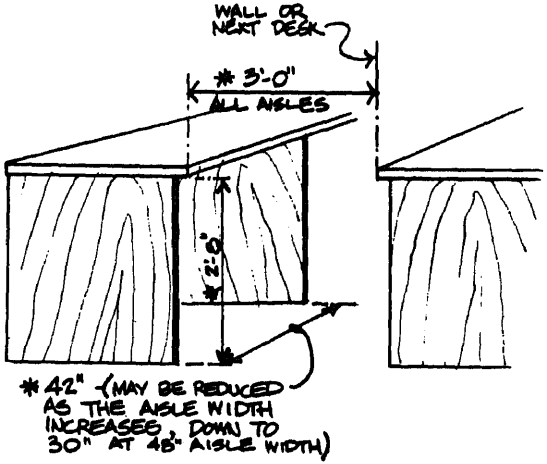
* KNURL ONLY DOORS LEADING TO DANGEROUS ARES



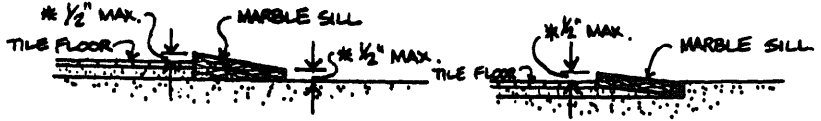


* IT IS RECOMMENDED THAT SIGNS IDENTIFYING ROOMS OR SPACES HAVE TACTILE LETTERS OR AN ADJACENT BRAILLE SIGN FOR THE BLIND.

SIGNS



DESKS, TABLES, OR BENCHES

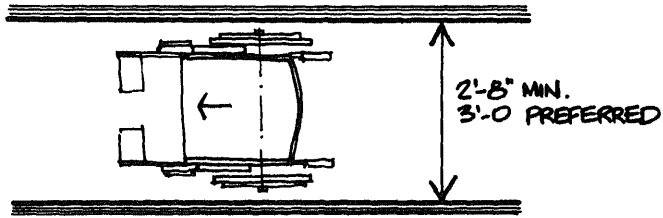


TOILET ROOM DOOR SILLS

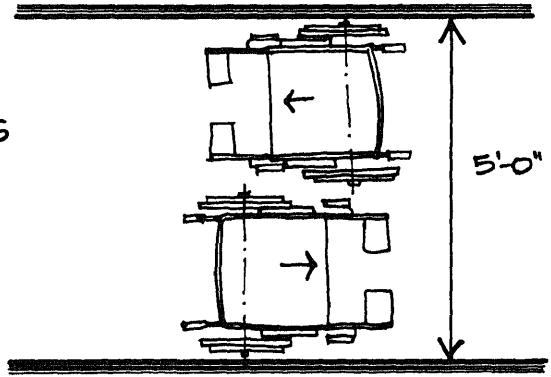
CORRIDOR & HALL TURNS

* REFER TO THE APPLICABLE BUILDING OR SAFETY CODES FOR POSSIBLY MORE STRINGENT REQUIREMENTS.

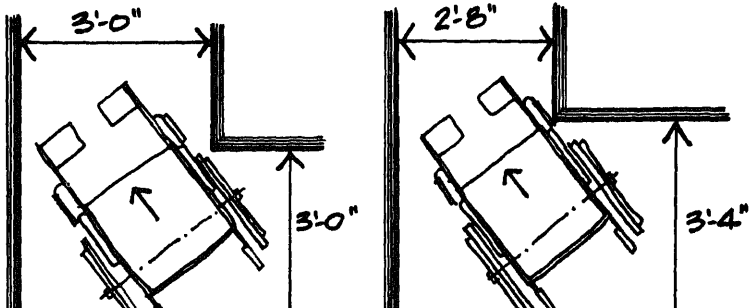
SINGLE CHAIR HALL



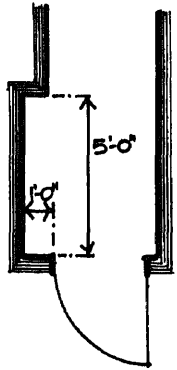
TWO CHAIRS PASSING CORRIDOR

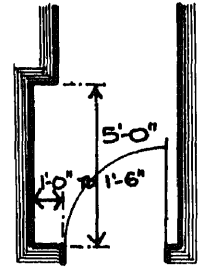


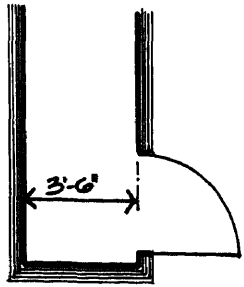
CORRIDOR TURNS

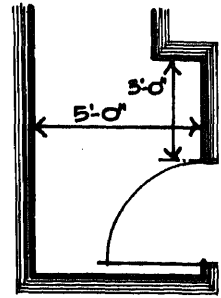


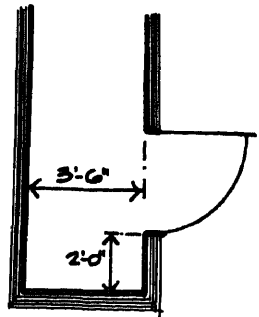
DOOR/CORRIDOR RELATIONSHIPS

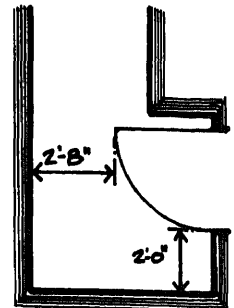










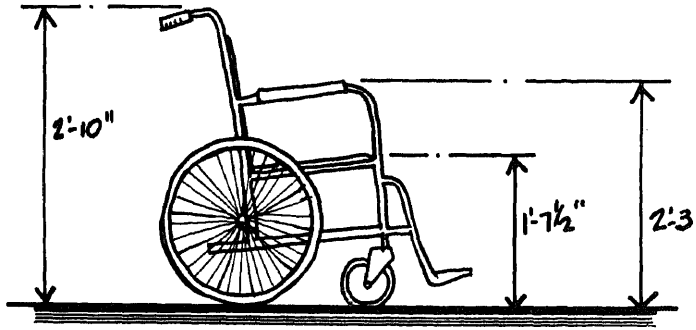


APPENDIX A

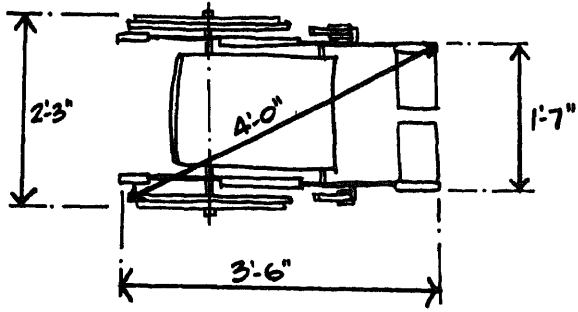
DESIGN REFERENCE DIMENSIONS

These dimensions are not a part of the Construction Code Commission "General Rules." They are being supplied with this booklet for general reference purposes only. For dimensional requirements in a specific case, refer to the Construction Code Commission "General Rules."

THE FOLLOWING DIMENSIONS ARE APPROXIMATE AVERAGES, BASED ON VARIOUS SIZES OF WHEELCHAIRS.

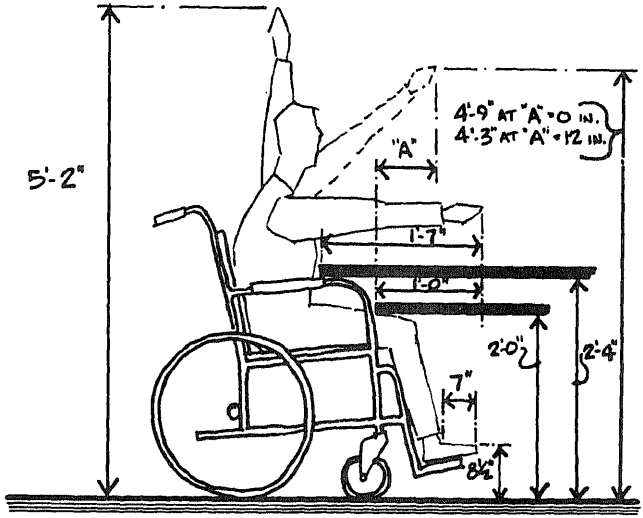


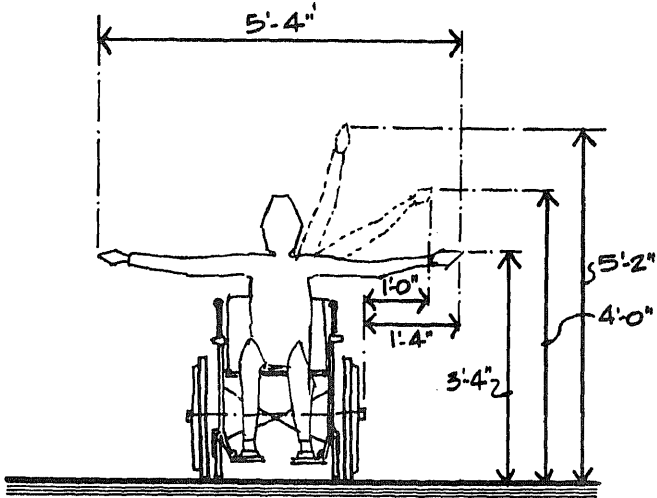
ELEVATION



FOR CHAIR-BOUND PEOPLE

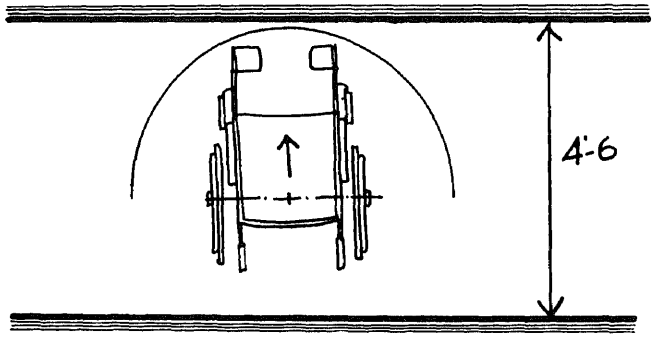
THESE DIMENSIONS ARE APPROXIMATE AVERAGES BASED ON BOTH MEN AND WOMEN OF VARIOUS SIZES.





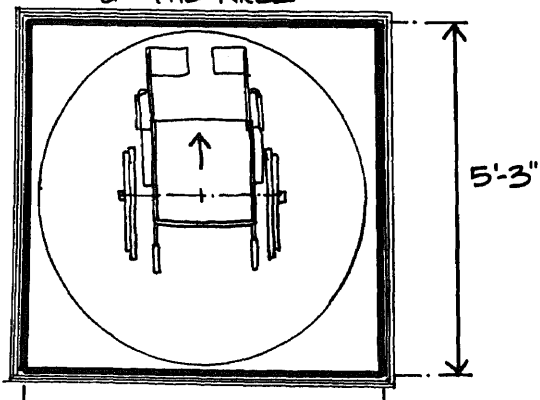
180° TURN

PIVOT ABOUT THE CENTER OF THE AXLE



360° TURN

PIVOT ABOUT THE CENTER OF THE AXLE



APPENDIX B

OTHER CURRENT MICHIGAN LEGISLATION

AND PROMULGATED STANDARDS

RELATIVE TO

MAKING FACILITIES ACCESSIBLE

FOR USE BY THE PHYSICALLY HANDICAPPED

AND AGED

PUBLIC ACT 8

1973

STATE OF MICHIGAN
77TH LEGISLATURE
REGULAR SESSION OF 1973

Introduced by Rep. Sietsema

Reps. Loren D. Anderson, Angel, Bennett, Bonior, Bradley, Brodhead, Brown, Richard D. Buth, Cop
Cramton, Crim, Damman, Defebaugh, DiNello, George H. Edwards, Elliott, Ferguson, Forbes,
Geake, Geerlings, Gingrass, Goemaere, Griffin, Hasper, Hayward, Hellman, Morris W. Hood, Jr.
mond W. Hood, Hunsinger, Jacobetti, Jondahl, Jowett, Keith, Kelsey, Kildee, Kok, Larsen, Ma
Markes, Mastin, McCollough, McNeely, Nelson, Novak, O'Neill, Owen, Powell, Prescott, Rosen
Sackett, Scott, Sheridan, Smart, Smeekens, Snyder, Spencer, Stackable, Stephen Stopczynski, Tha
C. Stopczynski, Strang, Thompson, VanSingel, Vaughn, Warner, Welborn, Richard A. Young and Z
named as co-sponsors

ENROLLED HOUSE BILL No. 4115

AN ACT to provide for the construction and maintenance of sidewalks for use by handicapped p

The People of the State of Michigan enact:

Sec. 1. A sidewalk hereafter constructed or reconstructed on public or private property for pub
within this state, whether constructed by a public agency or a person, firm, corporation, non-profit co
tion or organization, shall be constructed in a manner that will facilitate use by physically handic
persons. At points of intersection between pedestrian and motorized lines of travel, and at other
where necessary to avoid abrupt changes in grade, a sidewalk shall slope gradually to street level s
provide an uninterrupted line of travel. The department of state highways shall prescribe standa
slope gradient, width, and slip-resistant qualities which will assure that a sidewalk will accommo
person in a wheelchair or other handicapped persons. All agencies of state and local government i
ing school districts and other groups aforementioned, public or private, shall comply with these sta
and the provisions of this act when undertaking construction or reconstruction of affected streets,
or sidewalks, except that a local unit of government may adopt ordinances which provide for sta
at least equal to those provided by the department of state highways.

This act is ordered to take immediate effect.

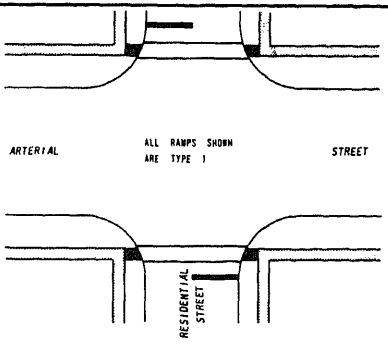
Clerk of the House of Representa

Secretary of the Se

SIDEWALK RAMP TYPE 3

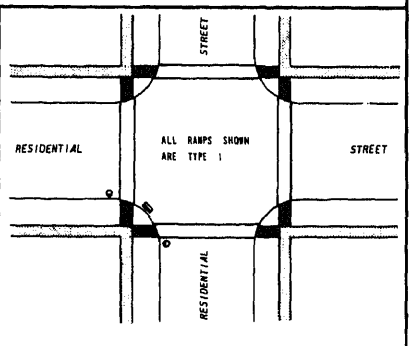
CROSSWALK MARKING

STOP LINE MARKING



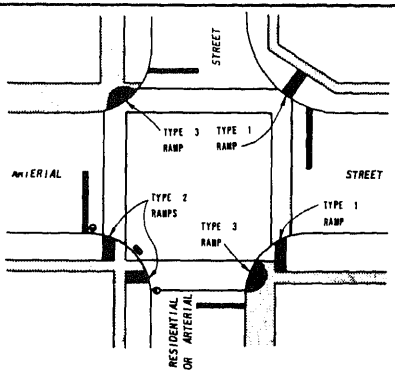
NO TRAFFIC SIGNAL
HEAVY TRAFFIC ON ARTERIAL

A



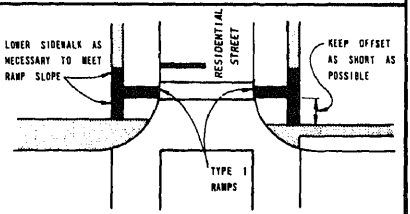
NORMAL TREATMENT IN RESIDENTIAL AREA

D



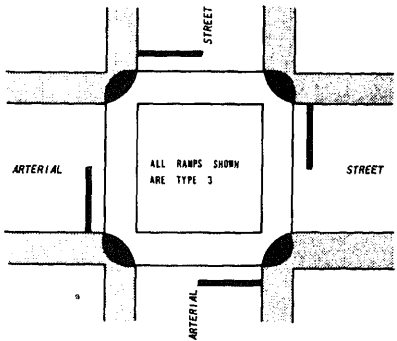
SIGNALIZED INTERSECTION
TYPICAL RAMP TREATMENTS

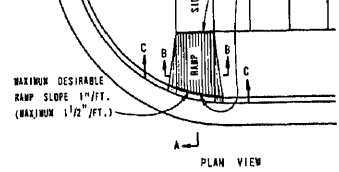
B



MAY BE USED ONLY WHERE TRAFFIC
VOLUME IS LOW AND WHERE OTHER
FEATURES MAKE DETAIL D IMPRACTICAL

E





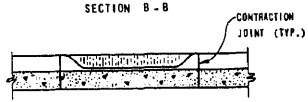
PLAN VIEW



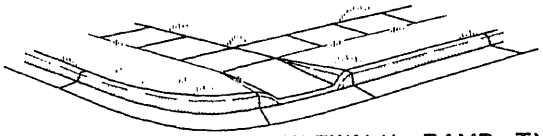
SECTION A - A



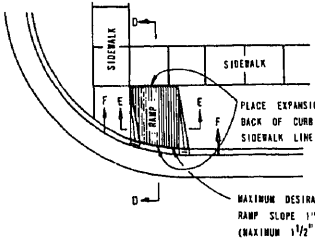
SECTION B - B



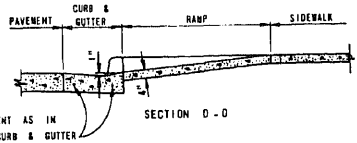
SECTION C - C



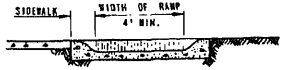
SIDEWALK RAMP TYPE 1



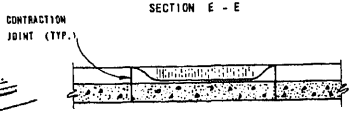
PLAN VIEW



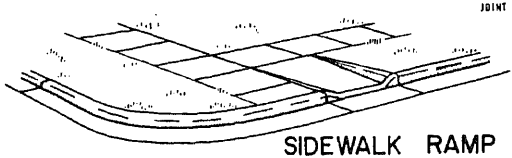
SECTION D - D



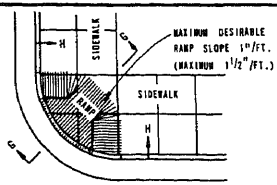
SECTION E - E



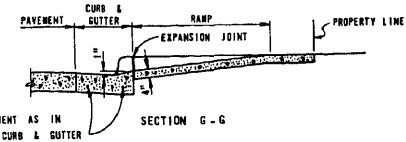
SECTION F - F



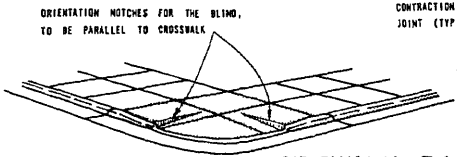
SIDEWALK RAMP TYPE 2

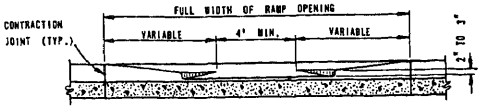


PLAN VIEW



SECTION G - G





SECTION H - H

SIDEWALK RAMP TYPE 3

NOTES:

DETAILS SHOWN ON THIS PLAN APPLY TO ALL CONSTRUCTION OR RECONSTRUCTION OF STREETS, CURBS OR SIDEWALKS BY ALL PUBLIC AGENCIES AND BY ALL PRIVATE ORGANIZATIONS.

CURB CUT RAMPS ARE TO BE LOCATED AS SHOWN ON THE PLANS OR AS DIRECTED.

RAMPS SHALL BE PROVIDED AT ALL CORNERS OF STREET INTERSECTIONS WHERE THERE IS EXISTING OR PROPOSED SIDEWALK AND CURB. RAMPS SHALL ALSO BE PROVIDED AT WALK LOCATIONS IN MID-BLOCK IN THE VICINITIES OF HOSPITALS, MEDICAL CENTERS, AND ATHLETIC STADIUMS.

SURFACE TEXTURE OF THE RAMP SHALL BE THAT OBTAINED BY A COARSE BROOMING, TRANSVERSE TO THE SLOPE OF THE RAMP.

SIDEWALKS SHALL BE RAMPED WHERE THE DRIVEWAY CURB IS EXTENDED ACROSS THE WALK.

CARE SHALL BE TAKEN TO ASSURE A UNIFORM GRADE ON THE RAMP, FREE OF SAGS AND SHORT GRADE CHANGES.

IF POSSIBLE, DRAINAGE STRUCTURES SHOULD NOT BE PLACED IN LINE WITH RAMPS. EXCEPT WHERE EXISTING DRAINAGE STRUCTURES ARE BEING UTILIZED IN THE NEW CONSTRUCTION, LOCATION OF THE RAMP SHOULD TAKE PRECEDENCE OVER LOCATION OF DRAINAGE STRUCTURE.

USE OF SIDEWALK RAMP TYPE 2 SHALL BE RESTRICTED TO LOCATIONS WHERE IT IS NOT FEASIBLE TO USE TYPE 1 OR 3.

THE NORMAL GUTTER LINE PROFILE SHALL BE MAINTAINED THROUGH THE AREA OF THE RAMP.

EXPANSION JOINT FOR THE TYPE 2 RAMP SHALL BE A MAXIMUM $1/2$" WIDE. THE TOP OF THE JOINT FILLER FOR ALL RAMP TYPES SHALL BE FLUSH WITH ADJACENT CONCRETE.

CROSSWALK AND STOP LINE MARKINGS, IF USED, SHALL BE SO LOCATED AS TO STOP TRAFFIC SHORT OF RAMP CROSSINGS. SPECIFIC DETAILS FOR MARKING APPLICATION ARE GIVEN IN THE "MICHIGAN MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES".

STATE OF MICHIGAN

DEPARTMENT OF STATE HIGHWAYS AND TRANSPORTATION

STANDARD PLAN FOR

SIDEWALK RAMP DETAILS

AS PROVIDED BY ACT 8, PUBLIC ACTS OF 1973

APPROVALS

CHECKED	F. J. Ash ENGINEER - DESIGN SECTION I	4-24-74 DATE
RECOMMENDED FOR APPROVAL	J. Bielevicz ENGINEER OF DESIGN	4-25-74 DATE
RECOMMENDED FOR APPROVAL	Mark N. Clyde ENGINEER OF TRAFFIC AND SAFETY	4-26-74 DATE
RECOMMENDED FOR APPROVAL	W. Lawson ENGINEER OF CONSTRUCTION	4/26/74 DATE

DEPARTMENT OF STATE HIGHWAYS AND TRANSPORTATION

JOHN P. WOODFORD - DIRECTOR

Act No. 180
Public Acts of 1974
Approved by Governor
June 27, 1974

STATE OF MICHIGAN
77TH LEGISLATURE
REGULAR SESSION OF 1974

Introduced by Reps. Sietsema, Forbes, Brown and Bryant
Reps. Kildee and McCollough named as co-sponsors

ENROLLED HOUSE BILL No. 6112

AN ACT to amend sections 2, 8 and 16 of Act No. 230 of the Public Acts of 1972, entitled "An act to create a construction code commission and prescribe its functions; to authorize the commission to promulgate rules relating to the construction, alteration, demolition, occupancy and use of buildings and structures; to provide for statewide approval of premanufactured units; to provide for the testing of new devices, materials and techniques for the construction of buildings and structures; to define the classes of buildings and structures affected by the act; to provide that cities, villages and townships may with exceptions elect not to be subject to the act; to provide for administration and enforcement of the act; to establish remedies and fix penalties for violations of the act; and to repeal certain acts and parts of acts," being sections 125.1502, 125.1508 and 125.1516 of the Compiled Laws of 1970.

The People of the State of Michigan enact:

Section 1. Sections 2, 8 and 16 of Act No. 230 of the Public Acts of 1972, being sections 125.1502, 125.1508 and 125.1516 of the Compiled Laws of 1970, are amended to read as follows:

Sec. 2. (1) As used in this act:

(a) "Agricultural purposes" means and includes purposes related to agriculture, farming, dairying, pasturage, horticulture, floriculture, viticulture, and animal and poultry husbandry.

(b) "Application for a building permit" means an application for a building permit submitted to an enforcing agency pursuant to this act and plans, specifications, surveys, statements, and other material submitted to the enforcing agency together or in connection with the application.

(c) "Barrier free design" means design complying with legal requirements for architectural designs which eliminate the type of barriers and hindrances that deter physically limited persons from having access to and free mobility in and around a building or structure.

(d) "Board of appeals" means the construction board of appeals of a governmental subdivision *provided for in section 14*

(f) "Building" means a combination of materials, whether portable or fixed, forming a structure affording a facility or shelter for use or occupancy by persons, animals, or property. The term does not include a building incidental to the use for agricultural purposes of the land on which the building is located if it is not used in the business of retail trade. The term shall be construed as though followed by the words "or part or parts thereof and all equipment therein" unless the context clearly requires a different meaning.

(g) "Business day" means a day of the year, exclusive of a Saturday, Sunday, or legal holiday.

(h) "Code" means the state construction code provided for in section 4 or a part thereof of limited application, and a modification of or amendment thereto.

(i) "Commission" means the state construction code commission created by section 3.

(j) "Construction" means the construction, erection, reconstruction, alteration, conversion, demolition, repair, moving, or equipping of buildings or structures.

(k) "Construction regulation" means a law, act, rule, resolution, regulation, ordinance, or code, general or special, or compilation thereof, heretofore or hereafter enacted or adopted, by this state or a county, city, village, or township including a department, board, bureau, commission, or other agency thereof, relating to the design, construction, or use of buildings and structures and the installation of equipment therein. The term does not include a zoning ordinance or rule issued pursuant to a zoning ordinance and related to zoning.

(l) "Enforcing agency" means the enforcing agency which, in accordance with section 9, is responsible for administration and enforcement of this act within a governmental subdivision, except that for purposes of section 19 it means the person or agency in a governmental unit principally responsible for administration and enforcement of applicable construction regulations.

(m) "Equipment" means plumbing, heating, electrical, ventilating, air conditioning, and refrigerating equipment.

(n) "Governmental subdivision" means a county, and a city, village, or township which in accordance with section 9 has assumed responsibility for administration and enforcement of this act.

(o) "Mobile home" means a vehicular, portable structure built on a chassis and designed to be used without a permanent foundation as a dwelling when connected to required utilities and which is, or is intended to be attached, to the ground, to another structure, or to a utility system on the same premises for more than 30 consecutive days.

(p) "Other laws and ordinances" means other laws and ordinances, whether enacted by this state or by a county, city, village, or township and any rules issued thereunder.

(q) "Owner" means the owner of the freehold of the premises or lesser estate therein, a mortgagee or vendee in possession, an assignee of rents, receiver, executor, trustee, lessee, or any other person, firm, or corporation directly or indirectly in control of a building, structure, or real property or his duly authorized agent.

(r) "Physically limited" means a temporary or permanent impairment or condition which causes a person to use a wheelchair; causes a person to walk with difficulty or insecurity; affects the sight or hearing to the extent that a person is insecure or exposed to danger or causes faulty coordination or reduces mobility, flexibility, coordination, or perceptiveness; and means persons who are limited in ambulation.

(s) "Premanufactured unit" means an assembly of materials or products intended to comprise all or part of a building or structure, and that is assembled at other than the final location of the unit of the building or structures by a repetitive process under circumstances intended to insure uniformity of quality and material content. The term includes a mobile home.

(t) "Structure" means that which is built or constructed, an edifice or building of any kind, or any piece of work artificially built up or composed of parts joined together in some definite manner. The term does not include a structure incident to the use for agricultural purposes of the land on which the structure is

its codes at least once every 3 years by adopting without amendment all changes thereto accepted by the bodies promulgating the nationally recognized model codes. However, a city, village, or township adopting nationally recognized model codes may approve amendments to those codes by ordinance. The amendments shall become effective 60 days after passage of the ordinance and 60 days after a certified copy thereof is delivered to the commission, unless the commission determines after a public hearing that the codes, as amended, do not adequately protect the health, safety, or welfare of the people of the city, village, or township, or that the amendments tend to unnecessarily increase construction costs or restrict the use of new materials, products or methods of construction or provide preferential treatment to types or classes of materials, products or methods of construction, or that the amendment obstructs the substantive uniformity of building codes within a region or locality in the state.

(2) The state construction code or any of its sections shall go into effect 6 months after its initial promulgation. The 6 month delay provided herein does not apply to rules promulgated to implement sections 19 and 21 and the requirements of barrier free design of this act and code from which a city, village, or township may not elect to exempt itself under subsection (1). The 6 month delay does not apply to amendments to the code or any of its sections after the initial promulgation. A city, village, or township which elects to exempt itself from this act and the code may do so within 6 months of the promulgation of the code in the manner provided in subsection (1) except that any amendments it adopts at that time are subject to review by the commission as set forth in subsection (1) within 90 days after a copy of the adopted amendments is delivered to the commission by certified mail with return receipt requested.

(3) A city, village, or township which elects to exempt itself from this act and the code is responsible for administration and enforcement of its codes.

(4) Locally adopted codes shall not apply to public or nonpublic schools within the political subdivision without concurrence by the school authorities having jurisdiction.

(5) Sections 19 and 21, other provisions of this act and code directly relating to the provisions of sections 19 and 21, and provisions of the code relating to the requirements of barrier free design shall be effective throughout the state without local modifications notwithstanding the exception of subsections (1), (2), (3), and (4). The standards for premanufactured housing shall not be less than the standards required for nonpremanufactured housing except that mobile homes shall be deemed to have complied with this requirement by compliance with the state code provisions adopting a nationally recognized mobile home code.

(6) The commission may limit the application of a part of the code so as to include or exclude:

(a) Specified classes or types of buildings or structures, according to use, or such other distinctions as may make differentiation or separate classification or regulation necessary, proper, or desirable. The commission shall consider the specific problems of the construction or alteration of a single family, owner-occupied recreational dwelling located in a sparsely populated area and which is to be occupied on a part-time basis.

(b) Specified areas of the state based on size, population density, special conditions prevailing therein, or such other factors as may make differentiation or separate classification or regulation necessary, proper, or desirable.

Sec. 16. (1) An interested person, or his authorized agent, may appeal a decision of a board of appeals to the commission within 5 business days after filing of the decision with the enforcing agency or, in case of an appeal because of failure of a board of appeals to act within the prescribed time, at any time before filing of the decision. The hearing of an appeal based on the denial of a request for a variance by a board of appeals is within the sole discretion of the commission. When deciding an appeal, the commission may act either as a whole or by a panel of 3 or more of its members designated by its chairman to hear and decide the appeal. A majority of a panel constitutes a quorum and a decision by a panel requires concurrence of at least a majority of the panel's members. When an appeal has been presented to the commission within the time prescribed, the appeal shall be heard de novo by the commission. The commission may affirm, modify, or reverse a decision of the board of appeals or the enforcing agency. Except when modified or reversed by a court of competent jurisdiction, a decision of the commission made pursuant to this section is binding on the applicant and the affected board of appeals and enforcing agency. An appeal to the commission shall be decided within 30 days after its receipt by the commission. A copy of the decision and a statement of reasons therefor, shall be sent to the applicant and filed with the affected board of appeals and enforcing agency within 5 business days after the making of the decision. A record of decisions made by the commission pursuant to this section, properly indexed, shall be kept in the office of the commission, and be open to public inspection during business hours.

plumbing, electrical, or barrier free design matter to the appropriate board. The board shall hear and decide the appeal in the same manner as an appeal is heard and decided by the commission pursuant to section 16, except that a board shall meet as a whole and not in a panel. A person aggrieved by a decision of a board on any appeal pursuant to this subsection may petition the commission to review the decision. The commission shall act on the petition within 5 business days after receipt, and may grant the petition at its discretion except it shall grant the petition if it appears that the appeal involves a question of major significance to the people of this state and that the case of the appellant has substantial merit. If the commission grants the petition, the commission acting as a whole shall review the decision in accordance with a procedure to be established by its rules.

This act is ordered to take immediate effect.

Thos Thatcher
Clerk of the House of Representatives.

Beryl J. Kenyon
Secretary of the Senate.

Approved June 27, 1974

William G. Milliken
Governor.

Act No. 190
Public Acts of 1974
Approved by Governor
July 2, 1974

STATE OF MICHIGAN
77TH LEGISLATURE
REGULAR SESSION OF 1974

Introduced by Reps. Sietsema, Traxler, Brown, Kok, Cramton, Thomas J. Anderson, Kelsey, Hasper, Raymond W. Hood, Gast, Warner, Griffin, Hunsinger, Bradley, Bennett, Stephen Stopczynski, Smeekens, Ferguson, Welborn, Wolpe, Thompson, Dively, Novak, Geerlings, Sackett, Forbes, Thaddeus C. Stopczynski, Kehres, Ogonowski, De Stigter, Markes, Richard A. Young, Loren D. Anderson, Varnum, Angel, Engler, Prescott, Van Singel, Gingrass, DiNello, Sheridan, Ziegler, Keith, Larsen, Richard D. Buth, Damman, Geake, Cawthorne, Mahalak, Rosenbaum, Owen, Huffman, Stackable, Bullard, Vaughn, Martin D. Buth, Scott, Otterbacher, Jondahl, Mastin, Bonior, Harrison, David S. Holmes, Morris W. Hood, Jr., Spencer, F. Robert Edwards, Powell, Trezise, Jacobetti, Mittan, Stallworth, Smith, Kirby Holmes, Sharpe, Symons, Farnsworth, O'Brien, Elliott, Kennedy, O'Neill, Goemaere, Bryant, Smart, Hellman, Ostling, Hoffman, Armbruster, Robert D. Young, Mowat, Strang, Hayward, Brennan, Baker, McNeely, Crim, George H. Edwards, Smit and Nelson
Reps. Kildee, McCollough, Brodhead, Copeland, Defebaugh, Guastello, Jowett, Snyder and Joseph F. Young named as co-sponsors.

ENROLLED HOUSE BILL No. 5214

AN ACT to amend the title and sections 1, 2, 3, 4, 5 and 6 of Act No. 1 of the Public Acts of 1966, entitled as amended "An act to provide for the accessibility and the utilization by the physically handicapped of certain buildings constructed with funds of the state or its political subdivisions and of certain buildings used by the public and to provide for the enforcement of the act," being sections 125.1351, 125.1352, 125.1353, 125.1354, 125.1355 and 125.1356 of the Compiled Laws of 1970.

The People of the State of Michigan enact:

Section 1. The title and sections 1, 2, 3, 4, 5 and 6 of Act No. 1 of the Public Acts of 1966, being sections 125.1351, 125.1352, 125.1353, 125.1354, 125.1355 and 125.1356 of the Compiled Laws of 1970, are amended to read as follows:

TITLE

An act to provide for the accessibility and the utilization by the physically limited persons of all facilities constructed with funds of the state or its political subdivisions and of all facilities and improved areas used by the public and to provide for the enforcement of this act.

Sec. 1. As used in this act:

(a) "Administrative authority" means the state or local official responsible for the administration and enforcement of the provisions of the act.

(b) "Barrier free design" means those architectural designs which eliminate the type of barriers and

(c) "Facilities used by the public" means a building, structure, or improved area utilized for purposes of education, employment, housing other than a privately owned 1 or 2 family dwelling, transportation, or recreation and for the purchase, rental, or acquisition of goods or services. Facilities used by the public does not include a public facility.

(d) "Improved area" includes parking lots, harbors, parks, beaches, public telephones, and drinking fountains.

(e) "Physically limited" means a temporary or permanent impairment or condition which causes a person to use a wheelchair; causes a person to walk with difficulty or insecurity; affects the sight or hearing to the extent that a person is insecure or exposed to danger or causes faulty coordination or reduces mobility, flexibility, coordination, or perceptiveness; and means persons who are limited in ambulation.

(f) "Public facility" means a building, structure, or improved area to which the public has access and utilizes, other than a privately owned 1 or 2 family residential structure which is:

(i) Constructed or altered by, or on behalf of, the state or its political subdivisions.

(ii) Leased or rented in whole or in part by the state after June 30, 1974, and after construction or alteration is in accordance with the plans and specifications of the state. A public facility which is the subject of a lease or rental agreement on June 30, 1974, shall not be required to meet standards and specifications for barrier free design for the term of the existing lease or rental agreement but shall be brought into compliance before a lease or rental agreement is renewed.

(iii) Financed in whole or in part by a grant or a loan made or guaranteed by the state or its political subdivisions after June 30, 1974.

(iv) Constructed, purchased, leased, or rented in whole or in part by the use of federal funds except as otherwise provided by federal law.

Sec. 2. (1) A public facility or facility used by the public constructed after the effective date of this amendatory act shall meet the barrier free design requirements contained in the state construction building code. This act shall apply to a temporary or emergency construction as well as to a permanent building.

(2) Existing public facilities and facilities used by the public undergoing reconstruction or renovation, remodeling, or rehabilitation after the effective date of this act shall meet the requirements of this act. If the reconstruction, remodeling, renovation, or rehabilitation involves less than 50% of the floor area that can be occupied by the public or employees of the building, facility, or improved area, only the areas being reconstructed, remodeled, renovated, or rehabilitated shall comply with the barrier free design specifications. If the reconstruction, remodeling, renovation, or rehabilitation involves 50% or more of the space of the building, facility, or improved area, the entire building, facility, or improved area shall be brought into compliance with the barrier free design specifications.

(3) Approval of the local or state administrative authority shall be secured before the issuance of a building permit, lease, or certificate of occupancy for a facility covered by this act.

Sec. 3. (1) The administration and enforcement of this act in respect to all public facilities owned or leased by the state, except for school buildings or facilities other than facilities at institutions of higher education as defined in section 4, article 8 of the state constitution of 1963, are vested in the department of management and budget.

(2) The administration and enforcement of this act in respect to school buildings as defined in Act No. 306 of the Public Acts of 1937, as amended, are vested in the department of education.

(3) The administration and enforcement of this act in respect to public facilities for which the administration and enforcement is not provided for in subsection (1), or (2), are vested in the department of labor.

(4) The administration and enforcement of this act in respect to facilities used by the public are vested in the building and inspection departments or agencies of local administrative authority with the responsibility and duty of issuing building permits.

Sec. 4. The bureau of facilities of the department of management and budget shall promulgate rules pursuant to Act No. 306 of the Public Acts of 1969, as amended, being sections 24.201 to 24.315 of the Michigan Compiled Laws to implement this act.

This act shall be administered and enforced by state and local administrative authorities in their respective areas of administrative responsibility.

remaining members, 1 shall be from the construction industry, 1 shall be a building inspector of a local unit of government, 1 shall be a registered architect, 1 shall be a professional engineer, and 1 shall be from the general public.

(2) The members shall serve for a term of 3 years except of those initially appointed 3 shall be appointed for a term of 1 year, 3 for a term of 2 years, and 3 for a term of 3 years. A vacancy shall be filled in the same manner as the original appointment for the balance of the unexpired term.

(3) Five members of the board constitutes a quorum. The board shall not take action without the concurrence of a majority of the board.

(4) The board shall meet not less than 6 times annually. Meetings shall be held in Lansing or in any other appropriate location as determined by the board.

(5) The board shall:

(a) Receive, review, and process requests for exceptions to the barrier free design specifications.

(b) Require appropriate equivalent alternatives when exceptions are granted.

(c) Receive, process, and review complaints of noncompliance.

(d) Make recommendations for barrier free design rules.

(6) An exception to any rule promulgated by the construction code commission relative to barrier free design may not be made by any local governmental unit, state department or agency, or person except as provided in subsection (5).

(7) The technical interpretation of a rule promulgated by the construction code commission relative to barrier free design is subject to the interpretation of construction code commission.

Sec. 6. (1) Upon initial discovery of a violation or suspected violation, the state or local administrative authority charged with responsibility for enforcement of this act shall serve notice of noncompliance in writing to the person, agency, or administrative authority responsible for the awarding of a construction contract, building permit, occupancy permit, or agencies responsible for disbursement of state and federal funds.

(2) Response to a notice of noncompliance shall be made in writing within 10 days and shall consist of an explanation of how requirements have or will be met or a request for an exception. If a violation exists, the person, agency, or administrative authority shall have 30 days to comply or file a statement of intent to comply.

(3) Failure to comply is a misdemeanor punishable by a fine of not more than $1,000.00. Upon obtaining a conviction, the state or local administrative authority charged with responsibility for enforcement may seek an injunction to halt construction or prevent the use of the public facility, facility used by the public, or improved area until compliance is obtained.

This act is ordered to take immediate effect.

T. Thomas Thatcher

Clerk of the House of Representatives.

Beryl J. Kenyon

Secretary of the Senate.

Approved July 2, 1974

William G. Milliken

DEPARTMENT OF LABOR

ELEVATOR SAFETY BOARD

ELEVATORS

Filed with Secretary of State,

These rules take effect 15 days after filing with the Secretary of St

(By authority conferred on the director of labor and the elevator safety board by section 8 of Act 227 of the Public Acts of 1967, as amended, and section 387 of Act No. 380 of the Public Acts of 1967, as added, being section 408.808 and 16487, of the Compiled Laws of 1948).

Rule 151 of the rules of the board entitled "Elevators", geing R 408. of the Michigan Administrative Code and appearing on pages 4317 and 4318 the 1967 Annual Supplement to the Code, is amended and a subpart entitled "Wheel Chair Elevating Devices" is added to Part 3, New Installations, to read as follows:

PART 1. GENERAL PROVISIONS

Rule 151. (1) Fees shall be paid in accordance with the following schedule:

Commissions to Inspect Elevators

Commission.....$10.00

Commission renewal.....5.00

Examinations for Certificates of Competency

Certificate of competency examination.....$10.00

Elevator Contractor' Licenses

Elevator Contractor's license.....$25.00

Elevator Contractor's examination.....10.00

Elevator Contractor's license renewal.....25.00

Installation Permits

Passenger, freight, one-man elevator or dumbwaiter--as follows:

Capacity in pounds

0 - 500 .....$35.00

501 - 1,500 .....40.00

1,501 - 3,000 .....45.00

3,001 - 5,000 .....50.00

5,001 - 10,000 .....55.00

10,001 - 20,000 .....60.00

Over 20,000 .....65.00

Plus $2.00 for each hoistway opening.

Escalator $50.00

Workmen's hoist-initial inspection 100.00

Tower rise 25.00

Private residence inclined lift 15.00

Belt manlift 50.00

Special elevating device 50.00

A final inspection fee is included in the installation permit fee.

If a scheduled final inspection is cancelled without due notice to the department or if the elevator is not complete in the judgment of the general inspector, an additional fee of $25.00 shall be charged to the elevator contractor.

Major Alteration Permits

Each alteration--one item as outlined in section 1200 and 1201 of the Standard	$ 20.00
Each additional alteration as outlined in section 1200 and 1201 of the Standard	10.00
Maximum alteration fee	100.00

A final inspection fee is included in the major alteration permit fee.

Certificates of Operation

Certificate of operation--1 year	$ 10.00
Temporary certificate of operation	20.00

Inspection by General Inspector

Inspection	$ 10.00
Follow-up inspection caused by non-compliance of correction order	10.00

Appeals

Appeals to the board	$ 25.00

Special Services

The department may provide upon written request special service not otherwise covered in the fee structure. The charge for this service

shall be at the rate of $10.00 per hour for travel incurred and consultation, not to exceed $65.00 in any 8 hour period.

(2) Fees required under the act shall be paid by cash, money order or certified check to the department. Money orders or certified checks shall be made payable to "Treasurer--State of Michigan."

PART 3. NEW INSTALLATIONS

WHEELCHAIR ELEVATING DEVICES

R 408.8531. Applicability of subpart.

Rule 531. (1) The rules in this subpart apply to an electric powered elevating device used to raise or lower a person in a wheelchair from 1 level to another, hereinafter in these rules referred to as a device. The device shall be restricted to 2 stories and shall serve not more than 2 landings.

(2) In addition to all applicable rules in this subpart all inclined devices shall also conform to all applicable rules in Section 502 of the ANSI A17.1-1971 Code for Elevators, Dumbwaiters, Escalators and Moving Walks which is incorporated herein by reference and is available for inspection at the Lansing office of the Michigan Department of Labor. This standard may be purchased from the American Society of Mechanical Engineers, United Engineering Center, 345 East 47th Street, New York, N. Y. 10017 or the Michigan Department of Labor, 300 East Michigan, Lansing, Michigan 48926 at a cost of $11.75 each.

R 408.8532. Location, travel and speed.

Rule 532. (1) A device may be installed adjacent to a porch, at the end of a ramp located over steps or in a stairwell.

(2) The rated speed of a device shall not exceed 40 feet per minute.

R 408.8533. Guards and ramps.

Rule 533. (1) All exposed equipment on a device shall be guarded to protect against accidental contact which could cause bodily injury.

(2) An approved guard shall be provided on any side of the platform which is not guarded as provided in subrule (3).

(3) A metal guard not less than 1/8 inch thick and 6 inches high shall be provided the full width of the platform to prevent a wheelchair from rolling off the lower access end of the platform when in use. The guard may be actuated automatically by movement from the landing.

(4) A ramp shall be provided, as required, for access to and from the platform and shall safely carry the load.

R 408.8534. Supports.

Rule 534. (1) The assembled unit of a device shall be supported and maintained in place so as to prevent any part from becoming loose or displaced.

(2) Adequate support shall be provided to maintain the device in a level position.

(3) The framework shall be securely anchored in place to the foundation.

R 408.8535. Frames, platforms and capacity.

Rule 535. (1) The frame of a device shall be constructed of metal.

(2) The platform shall be not more than 40 inches wide by 48 inches long.

(3) The rated capacity shall be not less than 350 pounds.

(4) A production model shall be subjected to a static load test to establish that all components of the device will withstand stresses of 5 times the rated load of the device, to ensure a factor of safety of at least 5. A registered professional engineer shall certify the safety factor and affix his signature and seal to the certification.

(5) All welding shall be in accordance with standards established by the American Society of Mechanical Engineers' Boiler and Pressure Vessel Code, Section 9, 1971 edition, dated July 1, 1971, together with addenda thereto dated December 31, 1971, June 30, 1972, December 31, 1972, and June 30, 1973, respectively, which are incorporated herein by reference and which are available for inspection at the Lansing office of the Michigan Department of Labor. These standards may be purchased from The American Society of Mechanical Engineers, United Engineering Center, 345 East Forty-Seventh Street, New York, N. Y. 10017, or from the Michigan Department of Labor, 300 East Michigan Avenue, Lansing, Michigan, 48926, at a total cost of $19.00.

(6) Means shall be provided on vertically traveling devices to prevent access below the platform when it is in a raised position; or the platform shall have equipment which will open an electric contact in the control circuit and thus stop the down travel of the platform, if the platform is obstructed in its downward travel by a force of not more than 4 pounds.

R 408.8536. Controls and Electrical Equipment.

Rule 536. (1) The operating control shall be of constant pressure type.

(2) A disconnecting means shall be provided that is not accessible to the general public.

(3) Electrical wiring and components in the device and its installation shall comply with the National Electrical Code ANSI C1-1971 (NFPA 70-1971)

at the Lansing office of the Michigan Department of Labor. This standard may be purchased from the American National Standards Institute, 1430 Broadway, New York, New York 10018 or the Michigan Department of Labor, 300 East Michigan, Lansing, Michigan 48926 at a cost of $3.50 each.

(4) A slack cable switch shall be provided where applicable.

(5) An upper terminal stopping switch shall be provided to stop a device at the upper terminal landing.

(6) When deemed necessary by the enforcing authority a lower terminal stopping switch shall be provided to stop a device at the lower terminal landing.

R 408.8537. Public assembly and institutional installations.

Rule 537. In addition to the requirements of rules 533 to 536 a device installed in a place of public assembly or in an institution shall be equipped with the following:

(a) A permanent weatherproof enclosure when exposed to the outside elements.

(b) An operating control of the constant pressure keyed-type. Only authorized persons shall have access to the keys.

R 408.8538. Nonskid surfacing.

Rule 538. Related surfacing on which a wheelchair rolls when using a device shall be of the nonskid type.

R 408.8539. Installation permits and acceptance inspections.

Rule 539. (1) An installation permit shall be obtained, before a device is installed. Installation shall be by an elevator contractor licensed by this state.

(2) An acceptance inspection shall be made by a general elevator inspector before the device is operated by the owner or user.

R 408.8540. Installation instructions.

Rule 540. Printed installation instructions shall be supplied with each device and may be reviewed and approved by the board. They shall include the following:

(a) Construction of an upper terminal ramp or dock-like landing of adequate strength and rigidity, with substantial handrails on each side, for installations not contiguous to a porch or permanent foundation and requiring travel over steps or open areas for access to and from the device.

(b) A movable barrier at the upper terminal landing to prevent a wheelchair from rolling off the end of that landing while waiting for the device, when deemed necessary by the enforcing authority.

(c) The horizontal surface of the landings, upon which a wheelchair rolls, shall be constructed as to safely carry the weight.

(d) A terminal landing shall be permanently fastened in place.

R 408.8541. Operation and maintenance manuals.

Rule 541. (1) The manufacturer shall provide an operational manual for each device describing the function and operation of the components including instructions for correct use of the device.

(2) The manufacturer shall provide a maintenance manual for each device, including recommended maintenance procedures as follows:

(a) Types of lubricants required and frequency of application.

(b) Definitions and measurements to determine excessive wear.

(c) Recommended frequency of service to specific components.

54. Equal Rights to Public Facilities. Blind persons, visually handicapped persons, and other physically disabled persons shall have the same right as the able-bodied to the full and free use of the streets, highways, sidewalks, walkways, public buildings, public facilities, and other public places. Leg. H. 1968 ch. 461.

54.1. Right to Full and Equal Access to Public Facilities.

(a) Blind persons, visually handicapped persons, and other physically disabled persons shall be entitled to full and equal access, as other members of the general public, to accommodations, advantages, facilities, and privileges of all common carriers, airplanes, motor vehicles, railroad trains, motorbuses, streetcars, boats or any other public conveyances or modes of transportation, hotels, lodging places, places of public accommodation, amusement or resort, and other places to which the general public is invited, subject only to the conditions and limitations established by law, or state or federal regulation, and applicable alike to all persons.

(b) Blind persons, visually handicapped persons, or other physically disabled persons shall be entitled to full and equal access, as other members of the general public, to all housing accommodations offered for rent, lease, or compensation in this state, subject to the conditions and limitations established by law, or state or federal regulation, and applicable alike to all persons.

"Housing accommodations" means any real property, or portion thereof, which is used or occupied, or is intended, arranged, or designed to be used or occupied, as the home, residence, or sleeping place of one or more human beings, but shall not include any accommodations included within subdivision (a) or any single family residence the occupants of which rent, lease, or furnish for compensation not more than one room therein.

Nothing in this subdivision shall require any person renting, leasing or providing for compensation real property to modify his property in any way or provide a higher degree of care for a blind person, visually handicapped person, or other physically disabled person than for a person who is not physically disabled.

Nothing in this part shall require any person rent-

without being required to pay an extra charge for t
guide dog; provided that he shall be liable for an
damage done to the premises or facilities by such
dog. Leg. H. 1968 ch. 461.

54.3. Denial or Interference With Admittance
Misdemeanor. Any person or persons, firm or corp
ration who denies or interferes with admittance to
enjoyment of the public facilities as specified in Se
tions 54 and 54.1 or otherwise interferes with th
rights of a totally or partially blind person or oth
disabled person under Sections 54, 54.1 and 54
shall be guilty of a misdemeanor. Leg. H. 1968,
461.

54.4. As Pedestrian Failure to Carry White Ca
or Use Guide Dog Not Negligence. A totally or pa
tially blind pedestrian shall have all the rights an
privileges conferred by law upon other persons in a
of the places, accommodations, or conveyances spe
fied in Sections 54 and 54.1, notwithstanding th
fact that such person is not carrying a predominant
white cane (with or without a red tip), or usin
a guide dog. The failure of a totally or partial
blind person to carry such a cane or to use such
guide dog shall not constitute negligence per se. Le
H. 1968 ch. 461.

54.5. White Cane Safety Day. Each year, th
Governor shall publicly proclaim October 15 a
White Cane Safety Day. He shall issue a proclam
tion in which:

(a) Comments shall be made upon the significan
of this chapter.

(b) Citizens of the state are called upon to obser
the provisions of this chapter and to take precautio
necessary to the safety of disabled persons.

(c) Citizens of the state are reminded of the po
cies with respect to disabled persons declared in th
chapter and he urges the citizens to cooperate i
giving effect to them.

(d) Emphasis shall be made on the need of the
tizenry to be aware of the presence of disabled pe
sons in the community and to keep safe and fun
tional for the disabled the streets, highways, sid
walks, walkways, public buildings, public facilitie
other public places, places of public accommodatio
amusement and resort, and other places which th
public is invited, and to offer assistance to disabl
persons upon appropriate occasions.

fully in the social and economic life of the state and to engage in remunerative employment. Leg. H. 1968 ch. 461.

54.6. Definitions. As used in this part, "blind," "totally blind," "visually handicapped," and "partially blind" means having central visual acuity not to exceed 20/200 in the better eye, with corrected lenses, as measured by the Snellen test, or visual acuity greater than 20/200, but with a limitation in the field of vision such that the widest diameter of the visual field subtends an angle not greater than 20 degrees. Leg. H. 1968 ch. 461.

AMENDMENTS MADE BY THE 1972 LEGISLATURE ARE UNDERLINED.

(Chapter 1560 of the 1969 Statutes)
(Chapter 821 of the 1971 Statutes)
(Chapter 488 of the 1972 Statutes)
(Chapter 1018 of the 1972 Statutes)

Part 5.5 (commencing with Section 19955), Division 13 of the Health and Safety Code:

Part 5.5

Access to Public Accommodations by Physically Handicapped Persons

19955. The purpose of this part is to insure that public accommodations or facilities constructed in this state with private funds adhere to the provisions of Chapter 7 (commencing with Section 4450) of Division 5 of Title 1 of the Government Code. For the purposes of this part "public accommodation of facilities" means a building, structure, facility, complex, or improved area which is used primarily by the general public as a place of gathering or amusement, and shall include auditoriums, hospitals, theaters, restaurants, hotels, motels, stadiums, and convention centers.

As used in this section, "hospitals" includes, but is not limited to, hospitals, nursing homes, and convalescent homes.

19955.5. All passenger vehicle service stations, shopping centers and office buildings constructed in this state with private funds shall adhere to the provisions of Chapter 7 (commencing with Section 4450) of Division 5 of Title 1 of the Government Code. As used in this section "office buildings"

and below the first floor or ground level are exempt from the requirements of this section if a ramp or elevator is not available to provide public access to such floors or levels.

19956. All public accommodations constructed in this state shall conform to the provisions of Chapter 7 (commencing with Section 4450) of Division 5 of Title 1 of the Government Code; and except that in multi-storied buildings, floors or levels above the first floor or ground level are exempt from the requirements of this chapter if a reasonable portion of all facilities and accommodations normally sought and used by the public in such a building are accessible to and usable by the physically handicapped.

19956.5. Any curb or sidewalk intended for public use that is constructed in this state with private funds shall conform to the provisions of Chapter 7 (commencing with Section 4450) of Division 5 of Title 1 of the Government Code.

This section shall apply, but not be limited in application, to any curb or sidewalk which after construction with private funds will be turned over to a city or county for public use, in order to provide full and easy access to, and use of, such curb or sidewalk by the physically handicapped.

19957. In cases of practical difficulty, unnecessary hardship, or extreme differences, a building department responsible for the enforcement of this part may grant exceptions from the literal requirements of the standards and specifications required by this part or permit the use of other methods or materials, but only when it is clearly evident that equivalent facilitation and protection are thereby secured.

19958. The building department of every city, county, or city and county shall enforce this part within the territorial area of its city, county, or city and county. The responsibility for enforcing Chapter 7 (commencing with Section 4450) of Division 5 of Title 1 of the Government Code in its application under this part shall be by such building department within the territorial area of its city, county, or city and county.

"Building department" means the department, bureau, or officer charged with the enforcement of laws or ordinances regulating the erection or construction of buildings.

19959. After the effective date of this section every existing public accommodation constructed prior to July 1, 1970, which is not exempted by Sec-

WHEREAS, The physically handicapped symbol has been adopted for use around the world by Rehabilitation International's 11th world congress; and

WHEREAS, The physically handicapped symbol is easily recognized by those handicapped; and

WHEREAS, No such standard symbol has been officially adopted by the State of California; now therefore, be it

Resolved by the Assembly of the State of California, the Senate thereof concurring, That the State of California adopt the following figure, which is white on a blue background, as its physically handicapped symbol which shall be prominently displayed at all entrances to public property, buildings and facilities which provide for access and use by the physically handicapped; and be it further



Resolved, That the private use of this symbol shall be encouraged; and be it further

Resolved, That the Chief Clerk of the Assembly shall prepare a suitable copy of this resolution and present it to the California Association of the Physically Handicapped and shall further dispatch a copy of this resolution and a copy of the symbol to the Director, State Department of General Services, the chairman

(Chapter 1368 of the 1971 Statutes)
(Chapter 1182 of the 1972 Statutes)

Chapter 7 (commencing with Section 4450), Divisi 5 of Title 1 of the Government Code:

Chapter 7

Access to Public Buildings by Physically Handicapped Persons

4450. It is the purpose of this chapter to insu that all buildings, structures, sidewalks, curbs and lated facilities, constructed in this state by the use state, county, or municipal funds, or the funds any political subdivision of the state shall be acces ible to and usable by, the physically handicappe All buildings, structures, and related facilities sha adhere to the American Standards Association Spe fications A 117.1 - 1961 for making buildings and cilities accessible to, and usable by the physicall handicapped.

4451. Except as otherwise provided in this se tion, this chapter shall be limited in its application all buildings and facilities stated in Section 4450 i tended for use by the public, which have any reaso able availability to, or usage by, physically hand capped persons, including all facilities used for ed cation and instruction including the University of C lifornia, the California State Colleges, and the vario junior college districts, which are constructed i whole or in part by the use of state, county, or mu cipal funds, or the funds of any politial subdivisio of the state.

Buildings, structures, and facilities, occupied 5 percent or more, which are leased, rented, contract sublet or hired for periods in excess of two years b any municipal, county, or state division of go vernment, or special district shall be made acces ible to and usable by the physically handicappe Exceptions to this paragraph may be made upon a plication to, and approval by, the Department of R habilitation.

All buildings and facilities constructed in thi state after the effective date of this chapter from an of these funds or any combination thereof shall co form to each of the standards and specifications prescribed in American Standards Association Spe fications A 117.1 - 1961 except Sections 2.3, 2.4 5.11, 5.12, and Figure 1 as related to section 5.4.

Administrative authorities as designated under Section 4453 may grant exceptions from the literal requirements of this standard or permit the use of other methods or materials, but only when it is clearly evident that equivalent facilitation and protection are thereby secured.

4452. It is the intent of the Legislature that American Standards Association Specifications A 117.1 - 1961 shall be used as minimum standards to insure that buildings, structures, and related facilities, covered by this chapter are accessible to, and functional for, the physically handicapped to, through, and within their doors, without loss of function, space, or facility where the general public is concerned.

Any unauthorized deviation from these standards and specifications shall be rectified by full compliance within 90 days after discovery of the deviation.

4453. The responsibility for enforcement of this chapter shall be as follows:

(a) Where state funds are utilized, by the Director of the Department of General Services.

(b) Where funds of counties, municipalities, or other political subdivisions are utilized, by the governing bodies thereof.

4454. Where state funds are utilized for any building or facility subject to this chapter, no contract shall be awarded until the Department of General Services has issued written approval stating that the plans and specifications comply with the intent of this chapter.

In each case the application for approval shall be accompanied by the plans and full, complete, and accurate specifications, which shall comply in every respect with any and all requirements prescribed by the Department of General Services.

The application shall be accompanied by a filing fee in amounts as determined by the Department of General Services. All such fees shall be deposited into a special account in the General Fund. Such account is available without regard to fiscal years for the use of the Department of General Services in carrying out its responsibilities under this chapter.

The Department of General Services shall consult with the Department of Rehabilitation in identifying

der to encourage and help them make all building facilities, and improved areas accessible to and usab by handicapped persons for purposes of rehabilit tion, employment, business, recreation, and all oth aspects of normal living.

4455.5. All new elevators in public buildings facilities after the operative date of this section sh have braille symbols and raised arabic numerals co responding to the numerals on the elevator butto embossed immediately to the right thereof.

All new door casings on all elevator floors aft the operative date of this section shall have the nu ber of the floor on which the casing is located er bossed in braille symbols and raised arabic numera on both sides at a height of 42 inches from the floo

4456. After the effective date of this section, a building or facility which would have been subject this chapter but for the fact it was constructed pri to November 13, 1968, shall comply with the pro sions of this chapter when alterations, structural r pairs or additions are made to such building or faci ty. This requirement shall only apply to the area specific alteration, structural repair or addition a shall not be construed to mean that the entire stru ture or facility is subject to this chapter.

4457. Any portable buildings leased or owned a school district which are not used by the physica handicapped and which are otherwise subject to t chapter may be excepted therefrom upon applicati to and approval by the Department of Rehabilitatio

Chapter 8

Rapid Transit

4500. Notwithstanding the provisions of any s tute, rule, regulation, decision or pronouncement the contrary, every local governmental subdivisio every district, every public and quasi-public corpo tion, every local public agency and public service c poration, whether incorporated or not and wheth chartered or not, in awarding contracts for equi ment or structures shall be obligated to require th all rapid transit equipment and structures shall be built that a handicapped person shall have ready a cess to, from and in such equipment and structur provided, however, that contracts for equipment a structures incidental to the operation of an urb transit system shall be exempt from this requireme

Facilities for Handicapped Persons

7250. The provisions of this chapter apply to all buildings or other facilities owned, leased, operated or managed by the state, county, city and county, district, or other political subdivision and which are usually or regularly open to members of the public.

7251. When a building contains special toilet facilities usable by a person in a wheelchair or otherwise handicapped, a sign indicating the location of such facilities shall be posted in the building directory, in the main lobby, or at any entrance specially used by the handicapped persons.

7252. When a building contains an entrance other than the main entrance which is ramped or level for use by handicapped persons, a sign showing its location shall be posted at or near the main entrance which shall be visible from the adjacent public sidewalk or way.

NORTH CAROLINA
STATE BUILDING CODE

VOLUME I
GENERAL CONSTRUCTION

SECTION (11X)

MAKING BUILDINGS AND FACILITIES ACCESSIBLE TO AND USABLE BY THE PHYSICALLY HANDICAPPED

Adopted by the North Carolina Building Code
Council in accordance with Act
of the General Assembly of
1957, Chapter 1138
March 13, 1973
Effective Date September 1, 1973

PUBLISHED BY
THE NORTH CAROLINA BUILDING CODE COUNCIL

and the

NORTH CAROLINA DEPARTMENT OF INSURANCE
P. O. Box 26387—Raleigh, North Carolina 27611
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FOREWORD

These provisions making buildings and facilities accessible to and useable by the physically handicapped were adopted on March 13, 1973 by the North Carolina State Building Code Council and takes the place of Section (11X) incorporated in the 1967 edition of the State Building Code and all the amendments made subsequent thereto.

These provisions were developed through several meetings with representatives of the Governor's Study Committee on Architectural Barriers, N. C. Chapter of American Institute of Architects, Professional Engineers of North Carolina, Council of Code Officials, N. C. Home Builders Association, N. C. General Contractors of America, N. C. Association of Plumbing, Heating and Cooling Contractors, N. C. Electrical Contractors Association, Property Control Division, Department of Administration, Medical Care Commission, Department of Human Resources, Division of School Planning, Department of Public Instruction and a special Committee of the Building Code Council consisting of Mr. Ray Moore, Chairman and Mr. Julian Altobellis and Mr. John Fox members. The Committee's goal was to recommend changes to Section (11X) which would not cause a real hardship on the owners, designers and constructors of buildings within the State and which would also provide for accessibility for the physically handicapped.

NOTE TO DESIGNERS AND OWNERS OF BUILDINGS

The goals of the physically handicapped person are to have access to and throughout all buildings so they can live a more normal life and assume full responsibilities as citizens. This goal is shared by everyone.

The application of building regulations by designers and owners should take into account the safety of all occupants including the physically handicapped. Elevators are usually incapacitated early in a fire, and they are not counted as means of egress. Since the physically handicapped need assistance to negotiate stairs in exiting a building, designers and owners of buildings should consider specially designed spaces for the physically handicapped on a level where an approved ramp to grade is provided so the handicapped may exit the building without assistance. If this is not possible, designers and owners should consider the normal use of the building while the physically handicapped occupy it to assure provisions for a sufficient number of able-bodied persons readily available to assist the physically handicapped in the evacuation from such spaces down the stairs and other means of egress provided as exits in case of a fire or other emergency.

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By Statute the Commissioners of Insurance has general supervision of the administration and enforcement of the North Carolina Building Code and the Engineering Division serves as the staff for the Building Code Council Officials of the Insurance Department are:

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Commissioner

KERN E. CHURCH, P.E.
Deputy Commissioner
Engineering and Building Codes and
Secretary to Council

MAKING BUILDINGS AND FACILITIES ACCESSIBLE TO, AND USABLE BY, THE PHYSICALLY HANDICAPPED

(NOTE: Replaces all previous Building Code Requirements for the Physically Handicapped.)

(11X)1—SCOPE

(11X)1.1—SCOPE

(a) This standard applies to all buildings and facilities regulated by the North Carolina State Building Code, with the exception of single-and two-family detached dwellings in accordance with the following:

Residential—A (Sleeping Occupancy)
Apartments, hotels, motels, dormatories—This Standard applies to all these buildings where specifically provided for in Section (11X)5.

Business—B
B-1—(Office Occupancy)—This Standard applies to all these buildings except that the requirements of this Standard may be waived by the enforcing authority where the code makes these requirements applicable for small buildings which are already built.

B-2 (Shopping)
Mercantile Stores and Shopping Centers—This Standard applies to all these buildings.

Schools—C (Educational Facilities)—This Standard applies to all these buildings and as specifically provided for in Section (11X)5.2.

Jails, Prisons, Mental Hospitals, Orphanages and Nursing Homes and Hospitals—This Standard applies to all public areas of these buildings and as specifically provided for in Section (11X)5.2.

Assembly—E
Stadiums, Grandstands, Theaters, Dance Halls, Skating Rinks, etc.—This Standard applies to all public areas of these buildings and as specifically provided for in Section (11X)6 and (11X)7. Assembly areas which are raised above the floor or on an incline need not meet these requirements provided spectator areas which are accessible for the handicapped are designed as a part of such an assembly.

Storage—F
Airplane Hangers, Garages and Warehouses
Industrial—G
Industrial Plants—This Standard applies to all these buildings except that the requirements of this standard may be waived by the enforcing authority for garages with attendants, heavy storage or industrial areas and other similar type occupancies.

(b) This Standard is mandatory on all new construction of buildings and facilities as herein defined and identified. The addition of a wing unit to an existing facility shall be considered new construction, of and by itself, and would therefore be mandated under this standard.

(c) This Standard does not apply to the restoration or authentic reconstruction of a historic structure approved (after consultation with the Governor's Study Committee on Employment of the Handicapped) by the Office (formerly Department) of Archives and History pursuant to the provisions of G. S. 121-7.5.

(11X)2—DEFINITIONS

(11X)2.1—NON-AMBULATORY DISABILITIES

Impairments that, regardless of cause of manifestation, for all practical purposes, confine individuals to wheelchairs.

(11X)2.2—SEMI-AMBULATORY DISABILITIES

Impairments that cause individuals to walk with difficulty or insecurity. Individuals using braces or crutches, amputees, arthritics, spastic and those with pulmonary and cardiac ills may be semi-ambulatory.

(11X)2.3—SIGHT DISABILITIES

Total blindness or impairments affecting sight to the extent that the individual functioning in public areas is insecure or exposed to danger.

(11X)2.4—HEARING DISABILITIES

Deafness or hearing handicaps that might make an individual insecure in public areas because he is unable to communicate or hear warning signals.

(11X)2.5—DISABILITIES OF INCOORDINATION

Faulty coordination of palsy from brain, spinal, or peripheral nerve injury.

(11X)2.6—AGING

Those manifestations of the aging processes that significantly reduce mobility, flexibility, coordination, and perceptiveness but are not accounted for in the aforementioned categories.

(11X)2.7—RAMPS, RAMPS WITH GRADIENTS

The term "ramp" is defined as a sloping walkway which is attached to a building as a means of moving from one floor elevation to another without encountering any obstructions.

(11X)2.8—WALK, WALKS

The term "walk" is defined as a predetermined, prepared-surface, exterior pathway leading to or from a building which is placed on the same level as the ground level immediately adjacent thereto.

(11X)3—SITE DEVELOPMENT REQUIRED FOR INGRESS AND EGRESS

(11X)3.1—GRADING

Access to primary entrances usually considered as major points of pedestrian flow to all buildings which Section (11X)1.1 applies to shall be provided for the handicapped through the proper grading or use of approach ramps. An exception shall be those primary entrances to residential units in privately owned residential projects, which are not part of schools or institutions, which are not identified in (11X)5.

NOTE: Such accessible entrances shall include primary public entrances connecting public transportation stops; primary entrances connecting parking areas specially designated for the handicapped; primary entrances connecting walkways, between buildings in a given complex (e.g., school campus buildings, apartment buildings, shopping center buildings, etc.)

shall be at least 48 inches wide and shall have a gradient no more than 5% except where handrails are provided, the gradient may be 8.33%.

(b) Such walks shall have a continuous common surface not interrupted by steps or abrupt changes in level greater than ½ inch. Where walks cross driveways or parking lots they shall blend to a common level by means of curb cuts and slopes not to exceed 5% graident. Care shall be taken that the curb cut is not in itself a hazard to the blind. Please refer to Appendix E for suggested curb cuts.

(c) All walks provided under (a) and (b) above shall be provided with a level area no less than 5 feet x 5 feet where they terminate at doors. In no case shall such walks extend less than 1 foot beyond the side from which the door opens.

(11X)3.3—PARKING LOTS

Parking lots provided for buildings to which Section 1.1 applies shall be provided with parking space as follows:

(a) Parking spaces for the handicapped shall be set aside and identified with signs for use by individuals with physical disabilities. The minimum number of assigned spaces shall be as follows:

(1) A minimum of one such parking space for the handicapped shall be provided and in addition at least one space per 50 spaces shall be set aside for the handicapped.

(b) Parking spaces identified for the physically handicapped that are placed on the diagonal or vertical shall be a minimum of 12 feet 6 inches wide and shall be located as near as possible to the main public entrance of a single building and centrally located where practical in parking lots that serve more than one building.

(11X)4—BUILDINGS

(11X)4.1—RAMPS

Ramps to buildings which Section 1.1 applies to shall conform to the following specifications:

(a) A ramp shall not have a slope greater than 1 foot in 12 feet, or 8.33% and shall be no less than 4 feet clear width and structurally designed to carry a minimum of 100 sq. ft. live load when free standing.

(b) A ramp shall have continuous handrails on at least one side, and preferably two sides, that are 32 inches in height, measured from the surface of the ramp, that are smooth, that extend one foot beyond the top and bottom of the ramp or turned at right angles where slope exceeds 5% or where the ramp is above the level on either side of such ramp. Care shall be taken that the extension of the handrails is not in itself a hazard and the extension should be made on the side of a continuing wall.

(c) A ramp shall have a surface this is non-slip.

(d) A ramp shall have a level platform at the top which is at least 5 feet by five feet. This platform shall extend at least 1 foot on the side from which the door opens.

(e) Each ramp shall have at least 5 feet of straight level clearance at the bottom.

(f) Ramps shall have 3'-0" long intermediate level platform at 30-foot intervals for purposes of rest and safety and shall have level platforms wherever they turn.

(11X)4.2—ENTRANCES

All primary entrances usually considered as major points of pedestrain flow to buildings which Section 1.1 applies to shall be usable by the physically handicapped.

(11X)4.3—DOORS AND DOORWAYS

Exterior and interior passage doors for buildings which Section (11X)1.1 applies to shall comply with the following requirements:

(a) Exterior and interior passage doors shall have a clear opening of no less than 32 inches when the door is open and shall be operable by a single effort. Two-leaf doors are not usable unless they operate by a single effort, and one of the two leaves meets this requirements.

(b) Distance between two doors (e.g. outer and inner) must be a minimum of 6 feet 6 inches.

(c) The floor on the inside and outside of each doorway shall be level for a distance of 5 feet from the door in the direction the door swings and shall extend one foot beyond each side from which the door opens.

(d) Where narrow stile frame glass doors are used, the bottom rail shall be a minimum height of 7½ inches.

(e) Exterior thresholds shall be beveled with a maximum edge height of ¾ inches. Interior thresholds shall be flush with the floor, or beveled at not more than 5% slope with a maximum edge height of ½ inch.

(f) Where door closers are used, the maximum pressure to open a door should not be over 8 pounds with a maximum of 15 pounds.

(g) Corridors which serve the above doorways shall be no less than 42" in width.

(11X)4.4—STAIRS

Stairs shall conform to Section 1115 and in buildings which Section 1.1 applies to, the following additional requirements shall be met:

(a) Steps in stairs shall not have abrupt (squared) nosing. (See Fig. 1 for acceptable nosing. One inch rounded nosing is also acceptable.)

(b) Stairs shall have at least one continuous handrail 32 inches as measured from the tread at the face of the riser.

(c) Stairs shall have at least one continuous handrail that extends at least 18 inches beyond the top step and beyond the bottom step or turned at right angles. Care shall be taken that the extension of the handrails is not in itself a hazard and the extensions should be made on the side of a continuing wall.

(11X)4.5—FLOORS

(a) Floors on a given story shall be a common level throughout or be connected by a ramp in accord with (11X)4.1(a) through (11X)4.1(f), inclusive except that thresholds meeting requirements of 4.3(e) may be used. Stages, balconies and bleachers are not required to conform to this requirement.

EXAMPLE 1: There shall not be a difference between the level of the floor of a corridor and the level of the floor of the toilet rooms, unless proper ramps are provided. Consideration should be given to depressing toilet floor construction if ceramic tile is used to provide for common level.

EXAMPLE 2: There shall not be a difference between the level of the floor of a corridor and the level of a meeting room, dining room, or any other room, unless proper ramps are provided.

(11X)4.6—TOILET ROOMS

A minimum of 2% of total fixtures shall meet the requirements of this section in buildings which Section (11X)1.1 applies to.

(11X)4.6. At least one fixture of each type in all toilet rooms with group facilities shall meet the requirements of this Section (11X)4.6. Where one or more toilet rooms are provided in an individual residential unit of publicly owned residential buildings, or privately-owned school and institutional or residential buildings, at least one toilet room shall comply with (11X)4.6(a), (11X)4.6(b)(3), and (11X)4.6(e)(g)(j).

(a) A minimum of 5 feet x 5 feet clear floor space shall be provided and the entrance door shall be located on one side of this clear width and open out or slide. Where total available floor space is a particularly crucial concern, and where toe space is provided under cabinets, toe space of no more than 6 inches in depth and a minimum of 8¾ inches in height on any one side, can be allowed to supplant part of the 5 feet x 5 feet clear floor space.

EXAMPLE: If toe space 8¾ inches in height and 6 inches in depth were provided under cabinets on two opposite sides of the toilet room, the remaining clear floor space in addition to the toe space is 4 feet x 4 feet. However, if the depth of the toe space is 12 inches on each of two opposite sides of a toilet room, the additional clear floor space would still have to be 4 feet x 4 feet.

(b) Toilet rooms shall have at least one toilet stall that meets the following requirements. NOTE: Where toilet rooms do not have group toilet facilities, the toilet room itself shall be considered the toilet stall as well as a toilet room and meet the requirements of 4.6 (a) above.

(1) Is at least 3 feet wide

(2) Is at least 6 feet deep

(3) Doors shall have a clear opening of not less than 32 inches when open, shall swing out or slide, and shall be operable by a single effort.

(4) Has a water closet with the seat 20 inches from the floor. Water closets for small children such as elementary school students shall meet the requirements for their use.

(5) Has stainless steel handrails on each side wall. Each handrail shall be 33 inches high and 36" long. Each handrail shall be parallel to the floor, 1¼ inches in outside diameter, shall have 1½ inches clear space between rail and wall, and be fastened securely at ends and center to support a 250 pound load. The center point in length of side handrails shall be at the front of the seat of the water closet.

(6) Has a minimum clear floor space of 42 inches in depth and 36 inches in width in front of the stall door.

(c) Toilet rooms shall have at least one lavatory with narrow aprons, which when mounted allow 29 inches clearance to the bottom of the apron.

(d) Maximum water temperatures to water outlets serving handicapped fixtures shall not exceed 120°F; and exposed hot water lines and drains shall be fully insulated.

(e) When mirrors and shelves are provided, at least one mirror and one shelf shall be placed above lavatories at a height not to exceed 40 inches above the floor, measured from the top of the shelf and the bottom of the mirror.

(f) Toilet rooms for men shall have at least one wall-mounted urinal with elongated lip with the opening of the basin 19 inches from the floor, or shall have floor-mounted urinals that are on a level with the main floor of the toilet room. Urinals for small children such as elementary school students shall meet the requirements for their use.

(g) Where a towel rack, a towel dispenser and other dispensers and disposal units are provided in toilet rooms, at least 1 of each shall not exceed a height of 40 inches from the floor.

(h) Where showers are provided, 2% or a minimum of one, whichever is greater shall be no less than 3' x 3' inside dimensions and shall not contain curbs except that thresholds for entering and leaving showers meeting the requirements of Section 4.3 (e) may be used.

(i) Shower stalls equipped for handicapped shall have the floor surface which is non-slip. Where stalls are used, a seat shall be positioned 19 inches above the floor and shall be hinged to fold against the wall. A grab rail shall be attached to the stall wall opposite the seat and shall extend around on the back of the wall. The water control shall be lever controlled with flexible hand shower spray, and soap tray shall be placed at a height not to exceed 40 inches above the floor. All control shall be single lever type. (See (j) below)

(j) Minimum toe space of 8¾ inches in height and 6 inches in depth shall be provided for cabinets in the toilet room area.

(11X)4.7—WATER FOUNTAINS

Buildings where Section (11X)4.1 applies and where water fountains are provided, such water fountains shall comply with the following requirements:

(a) Water fountains or coolers shall have upfront spouts and controls.

(b) Water fountains or coolers shall be hand-operated or hand- and foot-operated.

(c) Where provided, at least one per floor conventional wall or floor-mounted water cooler shall have a small fountain mounted on the side of the cooler, with the edge of the small fountain basin no higher than 30 inches above the floor. Wall-mounted, hand-operated coolers serve the able-bodied and the physically disabled when the cooler is mounted with the edge of the basin 36 inches from the floor.

(11X)4.8 TELEPHONES. See Appendix B for recommendations.

(11X)4.9—ELEVATORS

(a) Unless ramps meeting the requirements of (11X)4.1 are provided to serve each floor level at least one elevator shall be provided as follows:

(1) All buildings over 2 stories in height with occupancy of 100 or more persons above or below the main entrance floor.

(2) All administrative buildings of County, Municipal and State Government over 1 story.

(3) All publicly-owned school buildings and other buildings of similar occupancy over one story and all non-publicly owned school buildings over three stories with over 200 persons above or below the main entrance floor level. Basements with over 100 persons are counted as a story for the purpose of this section.

(4) All buildings over three stories regardless of the number of persons or occupancy classification with the exception of privately-owned residential buildings, schools or institutional buildings.

tactile identification beside the buttons.

(d) All elevators shall be so adjusted/controlled that the floor of the elevators when stopped, will conform to building floor levels with a ½ inch tolerance.

(11X) 4.10—CONTROLS

Switches and controls which are designed to be operable by the occupant for the control of light, ventilation, windows, draperies, doors in all places designed to be occupied by the handicapped and all similar controls where intended to be operable by occupant of frequent or essential use, shall be placed no higher than 4 feet from the floor. This does not apply to fire alarm and thermostatic controls.

(11X) 4.11—IDENTIFICATION

(a) Spaces that would normally be utilized by the visually handicapped (i.e., reception, toilet rooms) shall be identified by a plaque with raised or notched letters and/or numbers. This plaque shall be next to an entrance doorway or a height between 4 feet 6 inches and 5 feet 6 inches, measured from the floor, and shall be on the side nearest the door handle when the door is closed.

(b) Doors to stairs, loading platforms, boiler rooms, stages and fire escapes shall have knurled door handles or knobs.

(11X) 5—MINIMUM REQUIREMENTS FOR RESIDENTIAL SCHOOL, AND INSTITUTIONAL OCCUPANCIES.

(11X) 5.1—MINIMUM REQUIREMENTS FOR INDIVIDUAL PRIVATELY OWNED RESIDENTIAL OCCUPANCIES INCLUDING CONDOMINIUMS (See recommendations in Appendix D)

(11X) 5.2—MINIMUM REQUIREMENTS FOR THE CONSTRUCTION OF PUBLICLY-OWNED RESIDENTIAL PROJECTS AND PRIVATELY-OWNED HOTELS, MOTELS, SCHOOL AND INSTITUTIONAL RESIDENTIAL PROJECTS

In addition to other requirements set forth in other sections of the Handicapped Section of the North Carolina State Building Code, the following standards are minimum requirements:

(a) Where 1 or more toilet rooms are provided in an individual residential unit or suite of residential units of publicly-owned residential projects or privately-owned hotels, motels, school and institutional residential projects, a minimum of 5% or a minimum of 1, whichever is greater, toilet room shall comply with Appendix D, Subparagraph (d) (1), (2), (3), (7), (10), (12), and (13), and have walls capable of supporting handrails which can support a 250 pound load.

(b) Where kitchens are provided in individual residential units or suites of residential units of publicly-owned residential projects or privately-owned school or institutional residential projects, those kitchens shall comply with Appendix D, Subparagraph (b), (2), (8), (13), and (14).

(11X) 5.3—MINIMUM REQUIREMENTS FOR THE CONSTRUCTION OF PRIVATELY OWNED RESIDENTIAL UNITS INTENDED TO BE RENTED OR LEASED IN RESIDENTIAL PROJECTS WITH MORE THAN 10 INDIVIDUAL RESIDENTIAL UNITS.

In addition to other requirements in other sections of the Handicapped Section of the North Carolina State Building Code, with the exception of (11X) 4.6, 4.7, 4.8, 4.9, 4.11, 5.1, 5.2, 6 and 7, 5% or a minimum of one unit, of all

individual residential units to be rented or leased in privately-owned residential projects with more than 10 individual residential units, which are not school or institutional shall meet the following minimum requirements: (Note: The other requirements of Code to be met for such units include accessible primary entrances, connecting walkways, etc.)

(a) The individual dwelling unit or suite must be on one level throughout unless accessible by wheelchair from grade level.

(b) Kitchens shall meet or be adjustable to meet the following requirements:

(1) A minimum of 5 feet clear floor space between opposite cabinets or opposite cabinets and walls shall be provided to allow for wheelchair turns, except where 6 inches in depth and 8¾ inches in height toe space is provided. The entrance door shall open out or slide. Where total available floor space is particularly crucial concern, and where toe space is provided under cabinets, toe space of no more than 6 inches in depth and a minimum of 8¾ inches in height on any one side, can be allowed to supplant part of the 5 feet x 5 feet clear floor space.

EXAMPLE: If toe space 8¾ inches in height and 6 inches in depth is provided on opposite sides under cabinets, then the clear floor space can be 4 feet x 4 feet. However, if the depth of the toe space is 12 inches on each of opposite sides of a kitchen room, the additional clear floor space would still have to be 4 feet x 4 feet.

(2) For seated work in a chair or a wheelchair, an opening shall be provided under the counter for knee space. This opening shall be a minimum of 30 inches in width, 29 inches in height, and 24 inches in depth or the top of the counter under which this knee space is provided, shall be pull out or adjustable and be a minimum of 30 inches in width, 24 inches in depth, and no higher than 30½ inches from the floor.

(3) The door opening shall be no less than 32 inches clear opening. The door shall swing out or slide.

(c) One full bathroom in each unit or suite shall meet or be adjustable to meet the following requirements:

(1) The clear door opening shall be no less than 32 inches. The door shall swing out or slide.

(2) A minimum of 6 feet width between walls shall be required except at the end of the tub wall.

(3) A self-supporting wall-hung lavatory shall be provided where 5 x 5 feet floor space is not provided.

(4) Walls shall be capable of supporting handrails which can support a 250 pound load.

(5) When mirrors are provided, at least one mirror shall be placed above lavatories no higher than 40 inches above the floor, measured from the bottom of the mirror.

(6) Where provided, toilet rooms shall have at least one towel rack mounted at a height not to exceed 40 inches from the floor.

(7) The maximum hot water temperature for all plumbing fixtures shall not exceed 120° F.; and exposed hot water lines and drains shall be fully insulated.

(11X) 6—SEATING FOR ASSEMBLY

at a rate of no less than 1%, or a minimum of one, whichever is greater, of the total seating capacity. An additional number of identified seats equal to 1%, or a minimum of one, whichever is greater, of the total seating capacity shall be set aside for the handicapped with crutches and/or walkers.

(a) Such spaces and seating shall be located as an integral part of the overall floor plan of said assembly area.

(b) Seats and spaces shall be designed to conform with the requirements of accessibility for wheelchairs and crutches described in Appendix A.

(11X) 7—INSTRUCTIONAL FACILITIES, DINING HALLS, AND OTHER AREAS UTILIZING FIXED FACILITIES

(a) Where fixed tables are used, a minimum of 2%, or at least one, shall have 29 inches clearance under the table top, and if aprons are greater than 2 inches, they shall be recessed 1 foot. In dining areas and libraries, all fixed tables shall meet this requirement.

(b) Width between fixed tables shall be a minimum of 5 feet 5 inches.

(c) Outside rail heights of fixed tray slides in dining areas shall be no greater than 34 inches.

(d) Aisles between fixed tray slides and control railings in dining areas shall be a minimum of 34 inches.

(e) In areas with 24 or more fixed stations or seats (e.g., lecture halls, libraries, dining areas, and other work or study areas), or 2%, or at least one station or seat, shall be designed to conform with the requirements of accessibility for wheelchairs and crutches described in Appendix A.

(f) In laboratories and other work or study areas using work benches, each "handicapped station" shall have a low work bench with a clear minimum of 29 inches, (floor to underside of work area) and shall not have an apron.

(g) Aisles between fixed work benches shall have a minimum clear width of 3 feet.

(h) Aisles between fixed stacks in libraries shall be a minimum width of 4 feet.

APPENDIX A
DESIGN SPECIFICATIONS

(1)—WHEELCHAIR SPECIFICATIONS

The collapsible-model wheelchair of tublar mental construction with plastic upholstery for back and seat is most commonly used. The standard model of all manufacturers falls within the following limits, which were used as the basis of consideration.

(1) Length: 42 inches
(2) Width, when open: 27 inches average, 29 inches maximum
(3) Height of seat from floor: 19½ inches
(4) Height of armrest from floor: 29 inches
(5) Width, when collapsed: 11 inches

(2) FIXED TURNING RADIUS, WHEEL TO WHEEL

(a) The fixed turning radius of a standard wheelchair, wheel to wheel, (the tracking of the caster heels and large wheels of a wheelchair when pivoting on a spot) is 18 inches.

(b) The fixed turning radius, front structure to rear structure, (the turning radius of a wheelchair, left front-foot platform to right rear wheel, or right front-foot platform to left rear wheel, when pivoting on a spot) is 31.5 inches. The average turning space required is 60" x 60".

NOTE: Actually, a turning space that is longer than it is wide, specifically 63 by 56 inches, is more workable and desirable. In an area with two open ends, such as might be the case in a corridor, a minimum of 54 inches between two walls would permit a 360-degree turn.

(c) A minimum width of 60 inches is required for two individuals in wheelchairs to pass each other.

(3)—THE INDIVIDUAL FUNCTIONING IN A WHEELCHAIR

Extremely small, large, strong, or weak and involved individuals could fall outside the ranges of reach and their reach could vary. However, these reaches were determined using a large number of individuals who were functionally trained, with a wide range in individual size and involvement.

(a) The average unilateral vertical reach is 60 inches and ranges from 54 inches to 78 inches.

(b) The average horizontal working (table) reach is 30.8 inches and ranges from 28.5 inches to 33.2 inches.

(c) The bilateral horizontal reach, both arms extended to each side, shoulder high, ranges from 54 inches and averages 64.5 inches.

(d) An individual reaching diagonally, as would be required in using a wall-mounted dial telephone or towel dispenser, would make the average reach (on the wall) 48 inches from the floor.

(4)—THE INDIVIDUAL FUNCTIONING ON CRUTCHES AND WALKERS

Most individuals ambulating on braces or crutches, or both, or on canes are able to manipulate within the specifications prescribed for wheelchairs, although doors present quite a problem at times. However, attention is called to the fact that a crutch tip extending laterally from an individual is not obvious to others in heavily trafficed areas, certainly not as obvious or protective as a wheelchair and is, therefore, a source of vulnerability.

(a) On the average, individuals 5 feet 6 inches tall require 31 inches between crutch tips in the normally accepted gaites. (b) On the average, individuals 6 feet tall require 32.5 inches between crutch tips in the normally accepted gaites.

(5)—GENERAL NOTES

INDIVIDUALS with restrictions in the knee, ankle, or hip, with artificial legs, long leg braces, or comparable conditions cannot, without great difficulty and hazard, use steps with nosing as illustrated in Fig. 1a, but can safely and with minimum difficulty use steps with nosing as illustrated in Fig. 1b.

WHERE codes specify handrails to be at heights other than 32 inches, it is recommended that two sets of handrails be installed to serve all people. Where traffic is predominantly children, particularly physically disabled children, extra care should be exercised in the placement of handrails in accordance with the nature of the facility and the age group or groups being served. Dual handrails may be necessary.

CARE should be taken that the extension of the handrails is not in itself

surfaces or floor finishes. Such non slip surfaces are especially critical in bathroom and kitchens.

THE DESIGNING and mounting of the water closet is of considerable importance. A wall-mounted water closet with a narrow understructure that recedes sharply is most desirable. If a floor-mounted water closet must be used, it should not have a front that is wide and perpendicular to the floor at the front of the seat. The bowl should be shallow at the front of the seat and turn backward more than downward to allow the individual in a wheelchair to get close to the water closet with the seat of the wheelchair.

WHERE DOOR CLOSERS are used, time-delay closers are recommended.

ACCESS PANELS or manholes in floors, walks, and walls can be extremely hazardous, particularly when in use, and should be avoided.

LOW-HANGING DOOR closers that remain within the opening of a doorway when the door is open, or that protrude hazardously into regular corridors or traffic ways shall be avoided. A minimum height of 7 feet, measured from the floor, is recommended.

(6) **DESIGNATED WALKWAYS.** Where possible, designated walkways shall be provided to eliminate the need for the handicapped to walk or wheel behind parked vehicles.

(7) **TACTILE LETTERS** or numbers shall be used to identify rooms or offices.

(8) The International Symbol of Accessibility for the Handicapped shall be used and prominently displayed to identify accessible facilities, including, but not limited to, entrances to buildings, accessible restrooms, water fountains, public telephone, recreation and rest areas, etc.

Any advertising of such facilities, including trademark signs erected to identify facilities, shall display the International Symbol of Accessibility for the Handicapped.

(9) Audiable Signals for Elevators. Audiable, preferably verbal signals should be provided to identify each floor level served by each elevator to facilitate use by the blind.

APPENDIX B
PUBLIC TELEPHONES

All "banks" of public telephones should have at least one telephone which can be used by the physically disabled, including those in wheelchairs and those with hearing and sight disabilities.

The following are minimum requirements:

(a) The dial and headset shall be placed no more than 4 feet above the floor.

(b) The telephone shall be equipped for those with hearing disabilities with an adjustable volume control for the headset with instructions for use.

(c) The telephone shall be equipped for those with sight disabilities with visual and tactile instructions for use. Large tactile letters shall be used for instructions.

(d) On every floor where telephones are installed, at least one should be placed so that the dial and headset are no more than 4 feet above the floor, and equipped for those with hearing and sight disabilities and so identified with visual and tactile instructions for use.

APPENDIX C

MINIMUM REQUIREMENTS FOR THE CONSTRUCTION OF ALL RESIDENTIAL PROJECTS

For the purposes of this Section, a residential project shall be defined as 1 residential building, or a group of related residential buildings (such as those shown on a plat filed with a municipal or county planning department showing the relative location of buildings).

In no instance, shall units designed to be accessible to the handicapped be segregated from other units within the project by design (e.g., setting aside all residential units for the handicapped in 1 residential building in a large project, instead of equally distributing the units designed for the handicapped throughout the project)

APPENDIX D

MINIMUM SUGGESTIONS FOR THE CONSTRUCTION OF PRIVATELY OWNED RESIDENTIAL PROJECTS WITH RESIDENTIAL UNITS INTENDED TO BE SOLD, PRIMARILY TO THE PHYSICALLY HANDICAPPED AND/OR ELDERLY

(Specifications Obtained from Guidelines Utilized by the Department of Housing and Urban Development)

In addition to other requirements set forth in other sections of the Handicapped Section of the North Carolina State Building Code, 1 out of every 10 residential units should meet the requirements of this Section.

(a) The individual dwelling unit or suite must be on one level throughout.

(b) Kitchens shall meet or be adjustable to meet the following requirements:

(1) All work surfaces shall not exceed 34 inches in height except for the portion over a built-in dishwasher.

(2) Normal base cabinet too space shall be 6 inches minimum in depth and 8¾ inches minimum in height.

(3) The cooking range-oven combination shall be the drop-in type that will allow for the required toe space and all controls shall be on the front. Where separate cooking surfaces and oven are used, all controls shall be on the front. The top of the oven housing shall not exceed 52 inches in height above the floor.

(4) Controls for vent hoods and lights over cooking units shall be

nets over cooking surfaces, ovens and refrigerators. All shelving in wall cabinets shall be adjustable.

(8) A minimum of 5 feet clear floor space between opposite cabinets or opposite cabinets and walls shall be provided to allow for wheelchair turns except where 6 inches in depth and 8¾ inches in height toe space is provided in accordance with (11X) 4.6(a)

(9) Hot water controls shall be provided to insure a maximum temperature of 120°F for water at the sink; and exposed hot water lines and drains shall be fully insulated.

(10) Sink faucets shall be of the single level type.

(11) Kitchen pantries or cabinets used for pantry storage shall have adjustable shelves.

(12) Refrigerators, where provided, shall be self-defrosting or frost-free with the freezer located on the upper part of the refrigerator.

(13) For seated work in a chair or a wheelchair, an opening shall be provided under the counter for knee space. This opening shall be a minimum of 30 inches in width, 29 inches in height, and 24 inches in depth. The top of the counter under which this knee space is provided, shall be a minimum of 30 inches in width, 24 inches in depth, and no higher than 30 inches from the floor.

(14) Doors shall have a clear opening of not less than 32 inches when open, shall swing out or slide, and shall be operable by a single effort.

(c) All closets shall meet the following requirements:

(1) Hanging poles shall be adjustable from 4 feet above the floor to 5 feet 4 inches above the floor.

(2) Closet shelves shall be adjustable from 4 feet 2 inches above the floor to 5 feet 6 inches above the floor.

(d) Each bathroom in each unit or suite shall meet or be adjustable to meet the following requirements:

(1) Doors shall have a clear opening of not less than 32 inches when open, shall swing out or slide and shall be operable by a single effort.

(2) A minimum of 5 feet x 5 feet clear floor space between opposite cabinets or opposite cabinets and walls shall be provided to allow for wheelchair turns except where 6" depth by 8¾" height toe space is provided in accordance with (11X) 4.6 (a) with entrance door located on one side of this clear floor space.

(3) Stainless steel handrails shall be provided on each side wall. Each handrail shall be 33 inches high and 36 inches long. Each handrail shall be parallel to the floor, 1¼ inches in outside diameter, shall have 1½ inches clear space between rail and wall, and be fastened securely at ends and center to support a 250 pound load. The center point in length of side handrails shall be at the front of the seat of the water closet.

(4) Lavatories shall be mounted 2 feet 10 inches above the floor to the top of the lavatory and drains shall be trapped as near to the wall as possible.

(5) The front of the lavatory shall be no less than 22 inches from the wall.

(6) Lavatories and counter tops, where provided, shall not exceed 5 inches in depth.

(7) The maximum hot water temperature for all plumbing fixtures shall not exceed 120°F; and exposed hot water li..es and drains shall be fully insulated.

(8) Showers, where provided, shall be no less than 3 feet 4 inches x 4 feet 6 inches clear inside and shall not contain curbs. Doors or openings to showers shall be 3 feet 2 inches minimum in width and open out. The floor surface shall be non-slip. A seat shall be positioned 19 inches above the floor and shall be hinged to fold against the wall. A grab rail shall be attached to the stall wall opposite the seat and shall extend around on the back of the wall. The water control, diversionary shower spray and soap tray shall be placed at a height not to exceed 40 inches above the floor. All controls shall be single lever type.

(9) All water supply controls for lavatories and tubs shall be single lever control.

(10) When mirrors and shelves are provided, at least one mirror and one shelf shall be placed above lavatories no higher than 40 inches above the floor, measured from the top of the shelf and the bottom of the mirror.

(11) Medicine cabinets shall have adjustable shelves with top of the cabinet mounted no higher than 6 feet above the floor.

(12) Where provided, toilet rooms shall have at least one towel rack, at least one towel dispenser, and at least one other dispenser and disposal unit mounted at a height not to exceed 40 inches from the floor.

(13) Minimum toe space of 8¾ inches in height and 6 inches in depth shall be provided for cabinets in the toilet room.

(e) Window stool heights, except in bathrooms and kitchens, shall not exceed 30 inches above the floor.

(f) All electrical wall outlets shall be mounted a minimum of 16 inches above the floor, except to meet special requirements in kitchen and bathroom areas.

The North Carolina Building Code Council is empowered by North Carolina Statute to adopt provisions in the Building Code for regulating construction and use of buildings. Consequently, the provisions in this publication are law and enforceable. Since adoption of the provisions, the General Assembly of North Carolina ratified House Bill 1296, which reads as follows:

SECTION I. Curbs constructed on each side of any street or road, where both curbs and sidewalks are provided, and at other major points of pedestrian flow, shall meet the following minimum requirements:

(1) No less than two (2) curb ramps or curb cuts shall be provided per lineal block, located at intersections.

curb cuts shall be 8.33% (12 inches slope for every 1 inch rise) in relationship to the grade of the street or road.

(4) One (1) curb ramp or curb cut may be provided under special conditions between each radius point of a street turn-out of an intersection if adequate provisions are made to prevent vehicular traffic from encroaching on the ramp.

SECTION 2. Minimum requirements for curb ramps or curb cuts under SECTION 1 shall be met (1) in the initial construction of such curbs, and (2) whenever such curbs are reconstructed, including - but not limited to - reconstruction for maintenance procedures and traffic operations, repair, or correction of utilities.

SECTION 3. The Department of Transportation, Division of Highways, Highway Design Section, is authorized and directed to develop guidelines to implement this act in consultation with the Governor's Study Committee on Architectural Barriers (or the Committee on Barrier-Free Design of the Governor's Committee on Employment of the Handicapped if the Governor's Study Committee on Architectural Barriers ceases to exist). All curb ramps or curb cuts constructed or reconstructed in North Carolina shall conform to the guidelines of the Highway Design Section.

SECTION 4. The Department of Transportation, Division of Highways, Highway Design Section, is authorized and directed to provide free copies of this act, together with implementary guidelines and standards, to municipal and county governments and public utilities operating within the State.

SECTION 5. This act shall become effective September 1, 1973.

In the General Assembly read three times and ratified, this the 23rd day of May 1973.

REPRINT & Provisions of House Bill 1296

Compliments

of

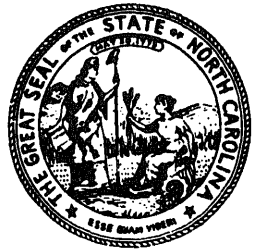
NORTH CAROLINA REHABILITATION ASSOCIATION

Mrs. Eleanor Ross, President

Grady R. Galloway, Chairman
Architectural Barriers Committee
P. O. Box 26053
Raleigh, North Carolina 27611

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GUIDELINES
CURB CUTS AND RAMPS FOR HANDICAPPED PERSONS



DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

HIGHWAY DESIGN BRANCH

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These guidelines for curb ramps were developed as part of an overall program of action to remove restrictive barriers which severely impede the daily movements of physically handicapped and elderly persons. The common curb is probably the most encountered barrier which denies these citizens the mobility to enjoy the privilege and right of a full, active role in society.

The details and guidelines included in this booklet were developed as directed by legislation enacted by the 1973 Session of the General Assembl identified as Ratified House Bill 1296 and codified as GS 136-44.14. A copy of this law is included. These guidelines were developed through con sultation with representatives of the Governor's Study Committee on Architectural Barriers and in accordance with recommendations included in their Final Report to the Governor, dated September 1, 1972.

This booklet is intended to be a general guide only. Many specific locations will involve problems particular to it alone, and therefore some deviation from this guide will be necessary. In these situations, the use of sound judgment and the recognition of those features which should be retained will produce a satisfactory design.

With the primary purpose of the program kept in mind and a positive approach taken to it, the success will be rewarding not only to the more than one-half million handicapped North Carolinians, but to you for doing your part.

In the case of construction or reconstruction of curbing on any existing or proposed public street, the city, county or State having jurisdiction shall require complete conformance to this law prior to permitting the encroachment for the construction or prior to acceptance of the street onto its system.

In the case of the reconstruction of curbing, the responsibility for providing the curb cut and ramp and all the work necessary to accomplish this including any removal and replacement of any existing curbs and sidewalks or any other work required to achieve the complete facility shall be upon the party which causes the existing curb to be cut.

In the case of the new construction of curbing, the responsibility for providing the curb cut and ramp and all the work necessary to accomplish this shall be upon the party causing the curb to be constructed.

GENERAL ASSEMBLY OF NORTH CAROLINA
1973 SESSION
RATIFIED BILL

CHAPTER 718

HOUSE BILL 1296

AN ACT TO PRESCRIBE STANDARDS FOR CURB RAMPS OR CURB CUTS FOR HANDICAPPED PERSONS.

Whereas, more than 500,000 North Carolinians are dependent on crutches, braces, or canes; confined to wheelchairs; crippled by arthritis; suffering from heart or lung diseases; enfeebled by old age; limited in mobility by blindness; and otherwise limited in mobility by physical disability; and

Whereas, thousands of North Carolinians become "temporarily disabled" every year due to broken legs, sprained ankles, pregnancy (latter stages); and

Whereas, due to advances in medicine and rehabilitation, the number of disabled and aged people in the population is steadily increasing, and fewer of them need be housebound; and

Whereas, many elderly citizens who are limited by disabilities late in life want to enjoy the fullness of community life which their efforts helped to build; and

Whereas, access to and use of sidewalks, walkways, streets, and highways is necessary for the physically disabled to fulfill their rights and responsibilities as citizens, to become employed and become taxpayers, and to exercise their constitutional right to "life, liberty, and property"; and

more fully utilize sidewalks and walkways, and highways and streets; Now, therefore,

The General Assembly of North Carolina enacts:

Section 1. Curbs constructed on each side of any street or road, where both curbs and sidewalks are provided and at other major points of pedestrian flow, shall meet the following minimum requirements:

(1) No less than two (2) curb ramps or curb cuts shall be provided per lineal block, located at intersections.

(2) In no case, shall the width of a curb ramp or curb cut be less than 40 inches.

(3) The maximum gradient of such curb ramps or curb cuts shall be 8.33% (12 inches slope for every 1 inch rise) in relationship to the grade of the street or road.

(4) One (1) curb ramp or curb cut may be provided under special conditions between each radius point of a street turn-out of an intersection, if adequate provisions are made to prevent vehicular traffic from encroaching on the ramp.

Sec. 2. Minimum requirements for curb ramps or curb cuts under Section 1 shall be met (1) in the initial construction of such curbs, and (2) whenever such curbs are reconstructed, including, but not limited to, reconstruction for maintenance procedures and traffic operations, repair, or correction of utilities.

Sec. 3. The Department of Transportation, Division of Highways, Highway Design Section, is authorized and directed to

Committee on Barrier-Free Design of the Governor's Committee on Employment of the Handicapped if the Governor's Study Committee on Architectural Barriers ceases to exist). All curb ramps or curb cuts constructed or reconstructed in North Carolina shall conform to the guidelines of the Highway Design Section.

Sec. 4. The Department of Transportation, Division of Highways, Highway Design Section, is authorized and directed to provide free copies of this act together with implementary guidelines and standards, to municipal and county governments and public utilities operating within the State.

Sec. 5. This act shall become effective September 1, 1973.

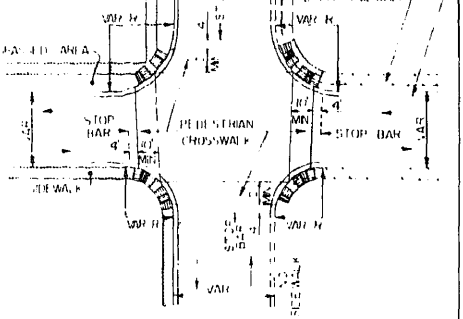
In the General Assembly read three times and ratified this the 23rd day of May, 1973.

JAMES B. HUNT, JR.

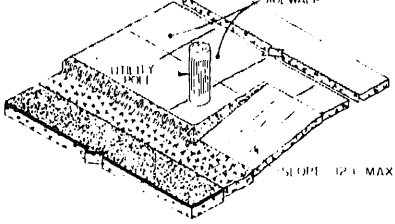
James B. Hunt, Jr.
President of the Senate

JAMES E. RAMSEY

James E. Ramsey
Speaker of the House of Representatives

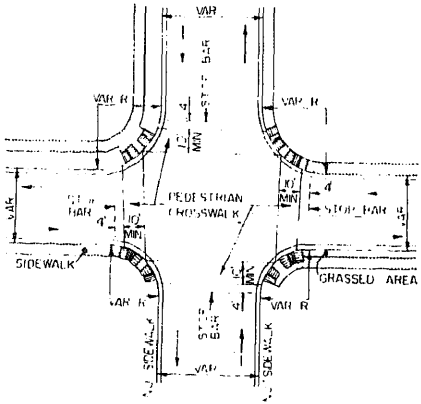


LOCATION OF WHEELCHAIR RAMPS WHEN EXISTING CURB & GUTTER AND SIDEWALK IS BEYOND END OF PROPOSED CONSTRUCTION

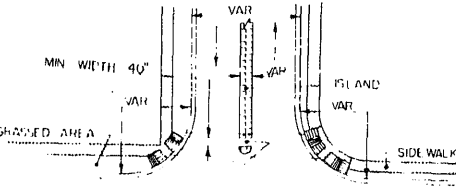


NOTE: USE THE METHOD SHOWN ABOVE WHEN OBSTRUCTIONS WHICH ARE NOT TO BE REMOVED, ARE ENCOUNTERED ON EITHER SIDE OF WHEELCHAIR RAMPS

ISOMETRIC VIEW

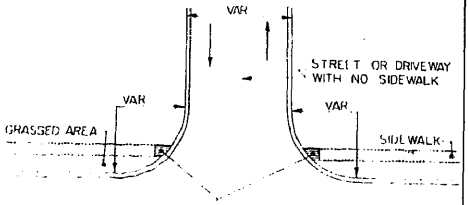


TYPICAL EXAMPLE OF WHEELCHAIR RAMP LOCATIONS WHEN CROSS ROAD DOES OR DOES NOT HAVE SIDEWALK

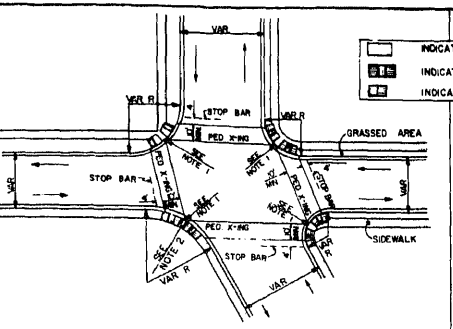


* RAMP IS CUT THROUGH DEPENDING ON ISLAND WIDTH (MAX SLOPE 1" IN 12")

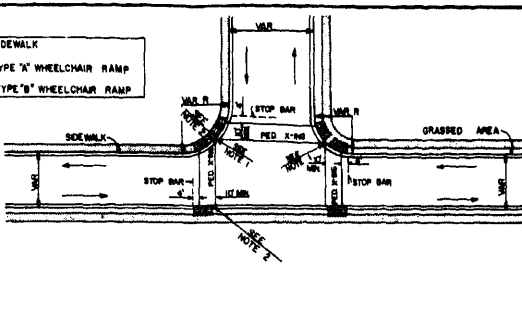
WHERE AN OBSTRUCTING ISLAND IS PRESENT THE PROVISION OF A RAMP OR CUT-THRU SHALL BE PROVIDED



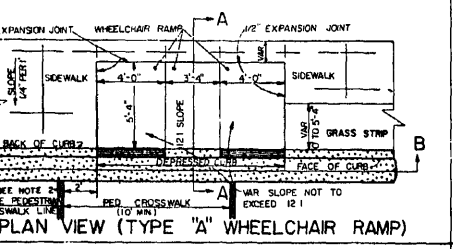
RAMP DOWN SIDEWALK



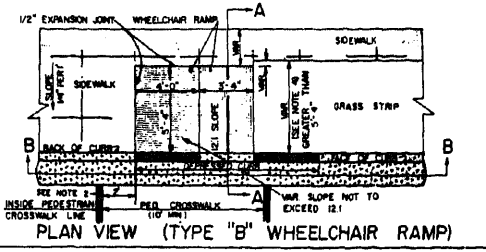
TAIL SHOWING TYPICAL LOCATION OF WHEELCHAIR RAMPS, DESTRIAN CROSSWALKS AND STOP BARS



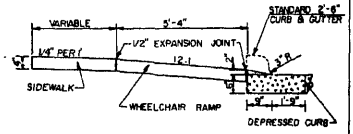
DETAIL SHOWING TYPICAL LOCATION OF WHEELCHAIR RAMPS, PEDESTRIAN CROSSWALKS AND STOP BARS FOR TEE INTERSECTION



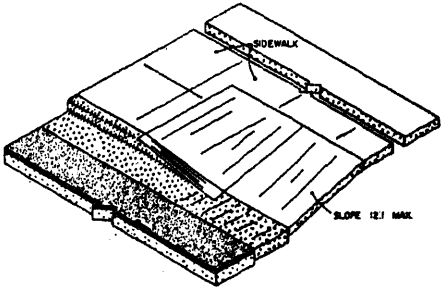
PLAN VIEW (TYPE "A" WHEELCHAIR RAMP)



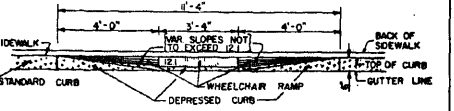
PLAN VIEW (TYPE "B" WHEELCHAIR RAMP)



SECTION A-A



ISOMETRIC VIEW



SECTION B-B

GENERAL NOTES

I. LOCATION OF WHEELCHAIR RAMPS:

1. IN ACCORDANCE WITH THE RATIFIED HOUSE BILL 1296. ALL STREET CURBS IN NORTH CAROLINA BEING CONSTRUCTED OR RECONSTRUCTED FOR MAINTENANCE PROCEDURES, TRAFFIC OPERATIONS, REPAIRS, CORRECTION OF UTILITIES OR ALTERED FOR ANY REASON AFTER SEPTEMBER 1, 1973 SHALL PROVIDE WHEELCHAIR RAMPS FOR THE PHYSICALLY HANDICAPPED AT ALL INTERSECTIONS WHERE BOTH CURB AND GUTTER AND SIDEWALKS ARE PROVIDED AND AT OTHER MAJOR POINTS OF PEDESTRIAN FLOW.

2. WHEELCHAIR RAMPS SHOULD BE LOCATED AS INDICATED IN DETAIL DRAWINGS, HOWEVER EXISTING LIGHT POLES, FIRE HYDRANTS, DROP INLETS, ETC. MAY AFFECT PLACEMENT.

II. CONSTRUCTION NOTES:

1. NO SLOPE SHALL EXCEED 1"=1" (12:1) ON THE RAMP OR SIDEWALK.

2. IN NO CASE SHALL THE WIDTH OF WHEELCHAIR RAMPS BE LESS THAN 40" [3'-4"]. WIDTHS MAY EXCEED 40" IF NECESSARY.

3. USE CLASS "B" CONCRETE WITH THE SURFACE HAVING A BROOM, NON-SKID TYPE FINISH.

4. A 1/2" EXPANSION JOINT WILL BE REQUIRED WHERE THE CONCRETE WHEELCHAIR RAMP JOINS ANY RIGID PAVEMENT OR STRUCTURE.

5. CONSTRUCTION METHODS SHALL CONFORM WITH THOSE OF THE GOVERNING BODY WHICH HAS JURISDICTION OF THE PARTICULAR STREET.

III. ADDITIONAL NOTES:

NOTE 1. THE INSIDE PEDESTRIAN CROSSWALK LINES SHALL BE ESTABLISHED BY BISECTING THE INTERSECTION RADII WHERE MARKED. (SEE NOTE 7)

NOTE 2. THE WHEELCHAIR RAMP SHALL BE LOCATED SO THAT THE BEGINNING OF THE WHEELCHAIR RAMP WILL BE TWO FEET FROM THE INSIDE PEDESTRIAN CROSSWALK LINE.

NOTE 3. THE WIDTH OF THE PEDESTRIAN CROSSWALK SHALL BE 10 FEET UNLESS A GREATER WIDTH IS REQUIRED TO ACCOMMODATE THE PEDESTRIAN TRAFFIC.

NOTE 4. TYPE "B" WHEELCHAIR RAMPS SHALL BE USED ONLY WHEN THE GRADED DISTANCE BETWEEN THE CURB AND SIDEWALK EXCEEDS 5'-0".

NOTE 5. STOP BARS SHALL BE USED WHERE IT IS IMPORTANT TO INDICATE THE POINT BEHIND WHICH VEHICLES ARE REQUIRED TO STOP IN COMPLIANCE WITH A TRAFFIC SIGNAL, STOP SIGN, OR OTHER LEGAL REQUIREMENT.

NOTE 6. PARKING SHALL BE ELIMINATED A MINIMUM OF 20 FEET BACK OF PEDESTRIAN CROSSWALK.

NOTE 7. ALL PAVEMENT MARKINGS SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES PUBLISHED BY THE FEDERAL HIGHWAY ADMINISTRATION. THIS IS AVAILABLE FROM THE SUPERINTENDENT OF DOCUMENTS, U.S. GOVERNMENT PRINTING OFFICE, WASHINGTON, D. C. 20402.

NOTE 8. REQUESTS FOR CLARIFICATION OR ASSISTANCE ON SPECIAL PROBLEMS MAY BE DIRECTED TO:

DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
HIGHWAY DESIGN BRANCH
HIGHWAY BUILDING
RALEIGH, N. C. 27611

AUG 1, 1973

GUIDELINES FOR:
WHEELCHAIR RAMPS AND DEPRESSED CURB
(FACILITY FOR PHYSICALLY HANDICAPPED)

PREPARED BY N.C. DEPARTMENT OF TRANSPORTATION (ROADWAY DESIGN UNIT)

AN ILLUSTRATED HANDB
OF THE HANDICAPPED SECT
OF THE NORTH CARO
STATE BUILDING C



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n ILLUSTRATED HANDBOOK
F THE HANDICAPPED SECTION
OF THE NORTH CAROLINA
STATE BUILDING CODE

ronald l. mace, a.i.a.
betsy laslett, editor

including a reprint of
general construction,volume 1
section 11x:making buildings &
facilities accessible to & usable
by the physically handicapped
and dec. 1973 amendments

for the governor's
study committee on
architectural barriers
chairman howard f. twiggs

and the north carolina
department of insurance
commissioner john r. ingram

governor james e. holshouser

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appendix D-related handicapped legislation

1 — an act to provide for treatment of handicapped and disabled persons equal to that afforded other persons

2 — an act to prescribe standards for curb ramps or curb cuts for handicapped persons

3 — an act to provide tax credits for removal of architectural barriers to the handicapped

4 — an act to amend the income tax act to provide a credit against income tax for the construction of dwelling units which satisfy the north carolina building code standards for handicapped living unit

index

preface

Aware of the difficulties of the physically handicapped in coping with environmental barriers, former Governor Robert W. Scott established in 1971 the Governor's Study Committee on Architectural Barriers. Governor James E. Holshouser, supporting the work of the Committee, extended it into 1973. Chaired by the Honorable Howard F. Twiggs, the Committee examined the problems of the handicapped and made recommendations which were published in their Interim Report in 1971 and Final Report in 1972. These recommendations initiated a revision of the North Carolina Building Code's handicapped section. After a year of negotiation and compromise with all building interests, a new, stronger, and more comprehensive section was written and approved by the Building Code Council in March, 1973, and became effective September 1, 1973. It was amended in December, 1973, and has been completely reprinted here for the Department of Insurance. **This handbook supercedes all previous publications of the handicapped section of the code.**

The new handicapped section provides the guidelines for making most new and remodeled buildings accessible to and usable by handicapped people—those in wheelchairs, on crutches, with leg braces, or with sight, hearing, or coordination defects, or those who through aging, accident, or disease move with difficulty. It is the spirit and intent of the code requirements to provide these people full and free use of all buildings and facilities in the State so that they may have the education, employment, living, and recreation opportunities necessary to be as self-sufficient as possible.

To assist the architects, engineers, builders, and building inspectors who will implement the code, it was suggested to the Governor's Study Committee that the new handicapped section be fully illustrated so that all those involved in designing and constructing buildings will be able to see quickly and clearly

y agreed to fund the preparation of this handbook. In
o the code material and the illustrations, we have in-
r reference in Appendix D reprints of four recent laws
ng the rights of the handicapped and the removal of
ural barriers.

unicate graphically the critical and subtle needs of
capped, each section of the code has been reviewed
rated; the drawings are accompanied by a reference to
section and an explanation of the code wording which
rinted on the facing pages. Wherever the code wording
e or complicated, we have made a particular effort to
d interpret the meaning.

rations are not only examples of minimal design re-
ts, but are also intended to show the reasons for them
esigners and builders can find new and better ways of
he needs of the handicapped. Since building code
s are of necessity minimal, and are therefore often not
possible solution, we have identified several which we
equate and have given alternative solutions which are
by the symbol PREFERRED * We hope these
be helpful to those conscientious designers who will
beyond the minimal requirements in providing for the
ped.

acknowledgments

This book would not have been possible without the original work of the Governor's Study Committee on Architectural Barriers established by former Governor Robert W. Scott, chaired by the Honorable Howard F. Twiggs. Production was made possible by a grant from the Council of State with the generous support of Governor James E. Holshouser who also continued the Governor's Study Committee into 1973 in order to assist with this work. I would also like to extend my thanks to the Honorable John R. Ingram, Commissioner of Insurance, for his time and interest; and to Kern E. Church, Deputy Commissioner and Secretary to the Building Code Council, for his support and patience in waiting for the completion of this book. To John Dalrymple, Vice-Chairman of the Governor's Study Committee, I would like to give special thanks for his unfailing enthusiasm and work on our behalf. Bill Laslett kindly made his office available to us and gave us endless encouragement. Those who have contributed more intimately to this project are Betsy Laslett, editing, proofing; Michael Quarterman, graphics; and Lane Atkins, photography.

Ronald L. Mace

NORTH CAROLINA STATE BUILDING CODE

VOLUME I
GENERAL CONSTRUCTION

SECTION (11X)

MAKING BUILDINGS AND FACILITIES ACCESSIBLE TO AND USABLE BY THE PHYSICALLY HANDICAPPED

Adopted by the North Carolina Building Code Council in accordance with Act of the General Assembly of 1957, Chapter 1138
March 13, 1973
Effective Date September 1, 1973

PUBLISHED BY THE NORTH CAROLINA BUILDING CODE COUNCIL

and the

NORTH CAROLINA DEPARTMENT OF INSURANCE
P. O. Box 26387—Raleigh, North Carolina 27611
Telephone 829-3901

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NORTH CAROLINA DEPARTMENT OF INSURANCE

By Statute the Commissioners of Insurance has general supervision administration and enforcement of the North Carolina Building Code a Engineering Division serves as the staff for the Building Code Council. C of the Insurance Department are:

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Commissioner

KERN E. CHURCH, P.E.
Deputy Commissioner
Engineering and Building Co
Secretary to Council

FOREWORD TO THE CODE

These provisions making buildings and facilities accessible to and useable by the physically handicapped were adopted on March 13, 1973 by the North Carolina State Building Code Council and takes the place of Section (11X) incorporated in the 1967 edition of the State Building Code and all the amendments made subsequent thereto.

These provisions were developed through several meetings with representatives of the Governor's Study Committee on Architectural Barriers, N. C. Chapter of American Institute of Architects, Professional Engineers of North Carolina, Council of Code Officials, N. C. Home Builders Association, N. C. General Contractors of America, N. C. Association of Plumbing, Heating and Cooling Contractors, N. C. Electrical Contractors Association, Property Control Division, Department of Administration, Medical Care Commission, Department of Human Resources, Division of School Planning, Department of Public Instruction and a special Committee of the Building Code Council consisting of Mr. Ray Moore, Chairman and Mr. Julian Altobellis and Mr. John Fox members. The Committee's goal was to recommend changes to Section (11X) which would not cause a real hardship on the owners, designers and constructors of buildings within the State and which would also provide for accessibility for the physically handicapped.

NOTE TO DESIGNERS AND OWNERS OF BUILDINGS

The goals of the physically handicapped person are to have access to and throughout all buildings so they can live a more normal life and assume full responsibilities as citizens. This goal is shared by everyone.

The application of building regulations by designers and owners should take into account the safety of all occupants including the physically handicapped. Elevators are usually incapacitated early in a fire, and they are not counted as means of egress. Since the physically handicapped need assistance to negotiate stairs in exiting a building, designers and owners of buildings should consider specially designed spaces for the physically handicapped on a level where an approved ramp to grade is provided so the handicapped may exit the building without assistance. If this is not possible, designers and owners should consider the normal use of the building while the physically handicapped occupy it to assure provisions for a sufficient number of able-bodied persons readily available to assist the physically handicapped in the evacuation from such spaces down the stairs and other means of egress provided as exits in case of a fire or other emergency.

(11X) Scope

a) This standard applies to all buildings and facilities regulated by the North Carolina State Building Code, with the exception of single-and two-family detached dwellings in accordance with the following:

Residential—A (Sleeping Occupancy)
Apartments, hotels, motels, dormatories—This Standard applies to all these buildings where specifically provided for in Section (11X)5.

Business—B
B-1—(Office Occupancy)—This Standard applies to all these buildings except that the requirements of this Standard may be waived by the enforcing authority where the code makes these requirements applicable for small buildings which are already built.

B-2 (Shopping)
Mercantile Stores and Shopping Centers—This Standard applies to all these buildings.

Schools—C (Educational Facilities)—This Standard applies to all these buildings and as specifically provided for in Section (11X)5.2.

Jails, Prisons, Mental Hospitals, Orphanages and Nursing Homes and Hospitals—This Standard applies to all public areas of these buildings and as specifically provided for in Section (11X)5.2.

Assembly—E
Stadiums, Grandstands, Theaters, Dance Halls, Skating Rinks, etc.—This Standard applies to all public areas of these buildings and as specifically provided for in Section (11X)6 and (11X)7. Assembly areas which are raised above the floor or on an incline need not meet these requirements provided spectator areas which are accessible for the handicapped are designed as a part of such an assembly.

Storage—F
Airplane Hangers, Garages and Warehouses
Industrial—G
Industrial Plants—This Standard applies to all these buildings except that the requirements of this standard may be waived by the enforcing authority for garages with attendants, heavy storage or industrial areas and other similar type occupancies.

b) This Standard is mandatory on all new construction of buildings and facilities as herein defined and identified. The addition of a wing unit to an existing facility shall be considered new construction, of and by itself, and would therefore be mandated under this standard.

c) This Standard does not apply to the restoration or authentic reconstruction of a historic structure approved (after consultation with the Governor's Study Committee on Employment of the Handicapped) by the Office (formerly Department) of Archives and History pursuant to the provisions of G. S. 121-7.5.

International symbol of accessibility for the handicapped



The International Symbol of Accessibility for the Handicapped should be used and prominently displayed to identify accessible facilities, including, but not limited to, entrances to buildings, elevators, accessible restrooms, water fountains, public telephones, recreation and rest areas, etc.

Any advertising of such facilities, including trademark signs erected to identify facilities, should display the International Symbol of Accessibility.

[11x]2 definitions

(11x)2.1—non-ambulatory disabilities

Impairments that, regardless of cause or manifestation, for all practical purposes, confine individuals to wheelchairs.

(11x)2.2—semi-ambulatory disabilities

Impairments that cause individuals to walk with difficulty or insecurity. Individuals using braces or crutches, amputees, arthritics, spastic and those with pulmonary and cardiac ills may be semi-ambulatory.

(11x)2.3—sight disabilities

Total blindness or impairments affecting sight to the extent that vidual functioning in public areas is insecure or exposed to danger.

(11x)2.4—hearing disabilities

Deafness or hearing handicaps that might make an individual in public areas because he is unable to communicate or hear warning si

(11x)2.5—disabilities of incoordination

Faulty coordination of palsy from brain, spinal, or peripheral nerve inj

(11x)2.6—aging

Those manifestations of the aging processes that significantly re bility, flexibility, coordination, and perceptiveness but are not acc in the aforementioned categories.

(11x)2.7—ramps, ramps with gradients

The term "ramp" is defined as a sloping walkway which is atta building as a means of moving from one floor elevation to anoth encountering any obstructions. Ramps are above normal level.

(11x)2.8—walk, walks

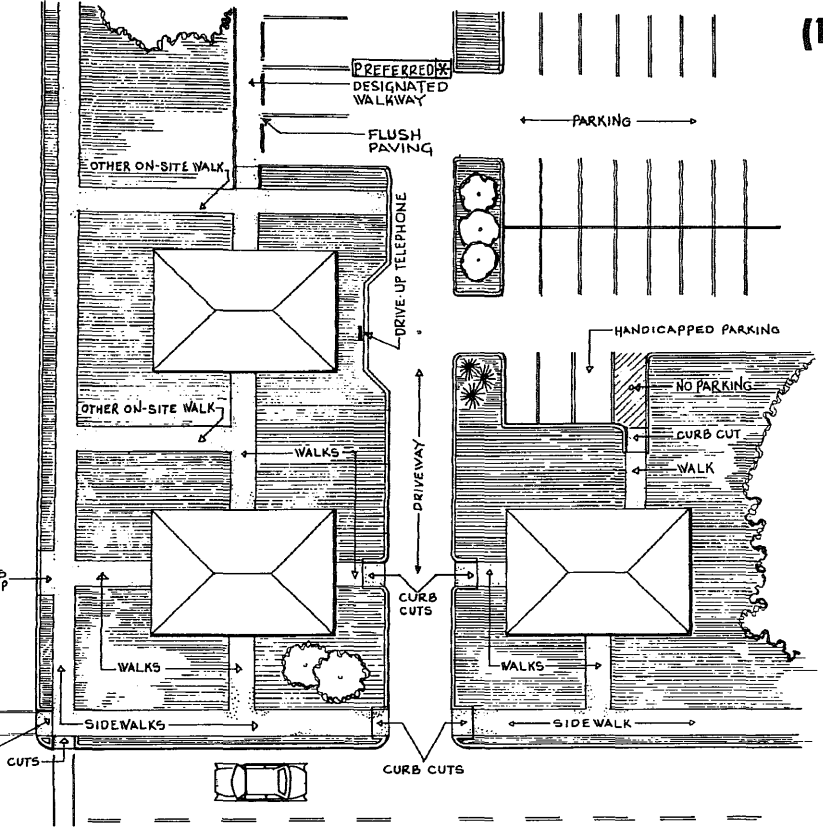
The term "walk" is defined as a predetermined, prepared-surfac pathway leading to or from a building which is placed on the sam the ground level immediately adjacent thereto.

[11x]3 - site development required ingress and egress

(11x)3.1—grading

Access to primary entrances usually considered as major points trian flow to all buildings which Section (11X)1.1 applies to shall be for the handicapped through the proper grading or use of approa An exception shall be those primary entrances to residential units i owned residential projects, which are not part of schools or institutio are not identified in (11X)5.

NOTE: Such accessible entrances shall include primary public connecting public transportation stops; primary entrances connectir areas specially designated for the handicapped; primary entrances walkways, between buildings in a given complex (e.g., school cam ings, apartment buildings, shopping center buildings, etc.)



LIC WALKS, AS DEFINED BY THE CODE, END
BUILDINGS AND DO NOT INCLUDE SIDEWALKS.
OTHER ON-SITE WALKS NOT CONNECTED TO
LDINGS IT IS PREFERRED* THAT STEPS,
UBT CHANGES IN LEVEL, AND STEEP SLOPES
AVOIDED.
VE-UP TELEPHONES ARE PREFERRED* AS A

(11x)3 site developmer

11x3.1 grading

ACCESS BY MEANS OF GI
APPROACH RAMPS, OR W
SHALL BE PROVIDED F
BUILDINGS EXCEPT PRIV
OWNED RESIDENTIAL PR
(HOUSES, CONDOMINIU
APARTMENTS LESS THAN
UNITS).

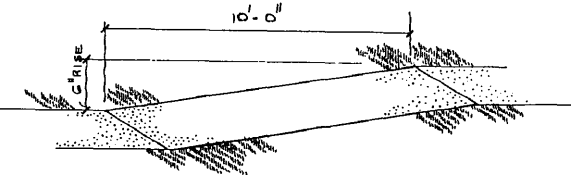
IT IS PREFERRED* WHER
POSSIBLE, THAT DESIGNA
WALKWAYS BE PROVIDED
ELIMINATE THE NEED OF T
HANDICAPPED TO WALK OR
WHEEL BEHIND PARKED VE

PUBLIC WALKS END AT
BUILDINGS AND CONNE
BUILDINGS WITH PUBLIC
TRANSPORTATION STO
HANDICAPPED PARKING
OTHER WALKWAYS, AND C
BUILDINGS IN THE SAME
COMPLEX.

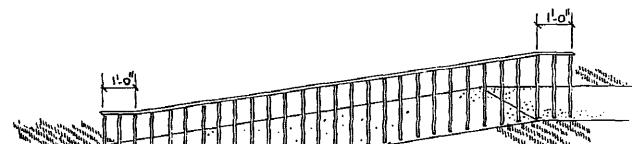
(11x)3.2—walks

a) Public walks connecting primary entrances as defined in (11X)3.1 shall be at least 48 inches wide and shall have a gradient no more than 5%. Where handrails are provided, the gradient may be 8.33%.

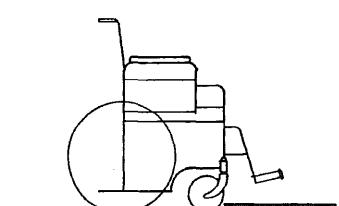
b) Such walks shall have a continuous common surface not interrupted by steps or abrupt changes in level greater than ½ inch. Where walks cross driveways or parking lots they shall blend to a common level by means of curb cuts, and slopes not to exceed 5% gradient. Care should be taken that the curb cut is not in itself a hazard to the blind.



5% SLOPE IS 1" RISE IN 20" OF RUN $\frac{1}{20}$



8.33 % SLOPE IS 1" RISE IN 12" RUN $\frac{1}{12}$



VERTICAL LEVEL CHANGES GREATER THAN ½" OBSTRUCT SMALL WHEELS OF CHAIR AND MAY TRIP THOSE WITH SEMI-AMBULATORY DISABILITIES (SEE 11X2.2)

11x3.2 walks

A WALK IS DEFINED AS A PREDETERMINED, PREPARE SURFACE, EXTERIOR PATHWA LEADING TO OR FROM A BUILDING AND ON THE SAM LEVEL AS THE ADJACENT GROUND. (SEE 11X2.8-WALKS

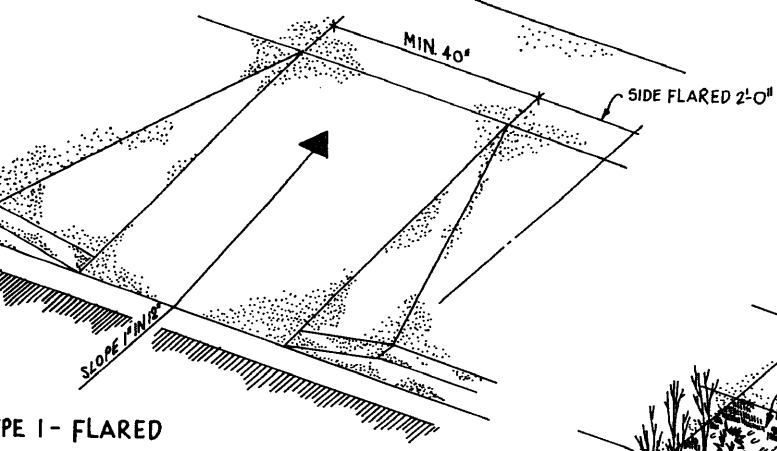
11x3.2(a) IF THE SLOPE OF THE WALK IS 5% OR LES THEN NO HANDRAIL REQUIRED.

IF THE SLOPE OF T WALK IS GREATER THAN 5%, A HANDR IS REQUIRED ON O SIDE (SEE 11X4.1 (b) HANDRAILS).

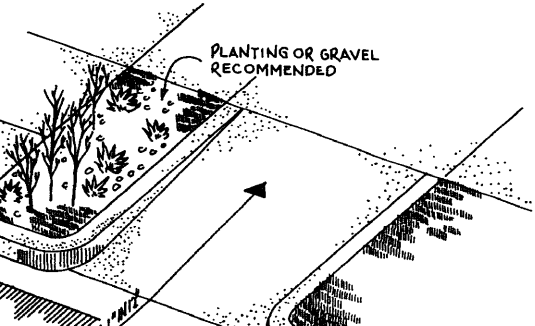
HANDRAILS ARE [PREFERRED*] ON BOTH SIDES.

THE SLOPE OF A W MAY NOT EXCEED 8.3

11x3.2(b) WALKS SHALL HAV CONTINUOUS COMM SURFACE NOT INTER ED BY STEPS OR ABRUPT CHANGES LEVEL GREATER T ½".



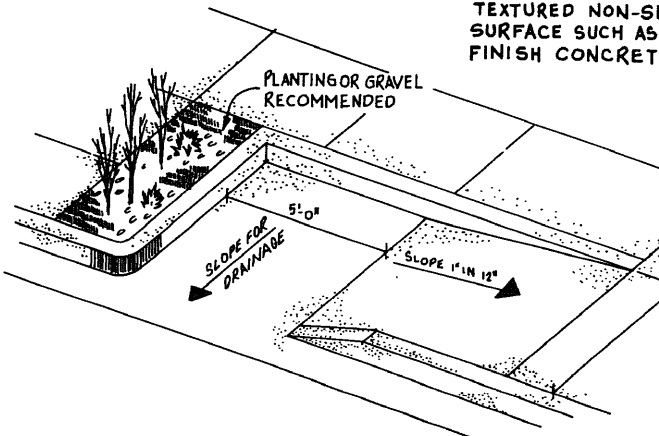
PE I - FLARED



E II - RADIUSED CURB
S TYPE PREFERRED BECAUSE
B PROVIDES VISUAL DEMARCATION
RECTIONAL ORIENTATION FOR

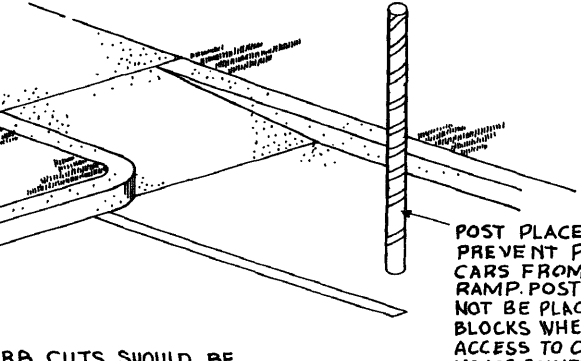
11x3.2(b) FOR CURB CUT DE
(CONT'D) REFER TO NORTH CA
GENERAL STATUTE
AND THE N.C. DEPAR
OF TRANSPORTATIO
DIVISION OF HIGHW
PUBLICATION," GUID
CURB CUTS AND R
HANDICAPPED PERS
AND RECOMMEND
CONTAINED HERE.

CURB CUT SHOULD
TEXTURED NON-SI
SURFACE SUCH AS
FINISH CONCRET



TYPE III - PARALLE
WHEN INSUFFICIENT
IS AVAILABLE FOR 8.
SLOPE, RAMP MAY R
PARALLEL TO STREE

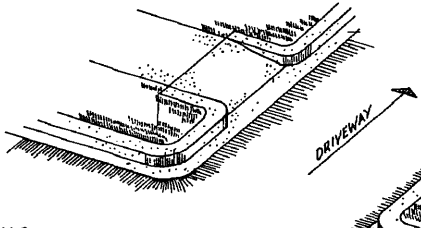
TYPE IV - WARPED
SEE N.C. DEPARTMEN
TRANSPORTATION DI
OF HIGHWAY PUBLICA
THIS TYPE REQUIRED
ALL STREETS, HIGHW

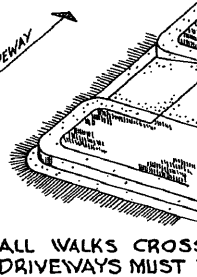


POST PLACED TO PREVENT PARKED CARS FROM BLOCKING RAMP. POST SHOULD NOT BE PLACED WHERE IT BLOCKS WHEELCHAIR ACCESS TO CARS. AT MAJOR POINTS OF PEDESTRIAN FLOW, POST SHOULD BE TALL ENOUGH & APPROPRIATELY PAINTED OR MARKED TO EASILY BE SEEN OVER PEOPLE'S HEADS.

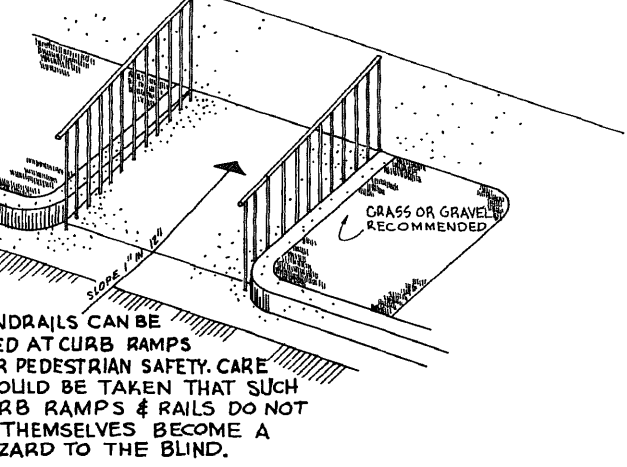
RB CUTS SHOULD BE
CATED WHERE IT IS
POSSIBLE FOR THEM
BE OBSTRUCTED BY CARS
R OTHER BARRIERS.

11X3.2(b) CURB CUTS (CONT'D)

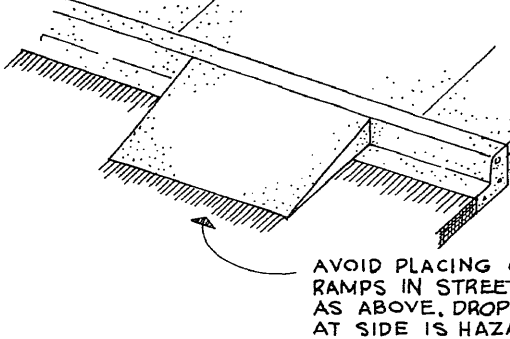




11x3.2(b) ALL WALKS CROSS
DRIVEWAYS MUST
DOWN TO A COM
LEVEL WITH THE
CARE SHOULD BE TA
THAT CURB CUT IS
IT SELF A HAZARD
BLIND.



NDRAILS CAN BE
ED AT CURB RAMPS
R PEDESTRIAN SAFETY. CARE
OULD BE TAKEN THAT SUCH
RB RAMPS & RAILS DO NOT
THEMSELVES BECOME A
ZARD TO THE BLIND.

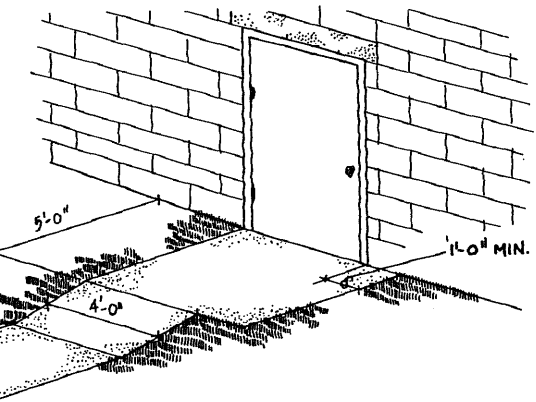


AVOID PLACING
RAMPS IN STREE
AS ABOVE. DROP
AT SIDE IS HAZA
TO ALL UNLESS
IS GREATER THA
WIDE WITH SIDE
GRADUALLY FEAT
AT A SLOPE OF

(11x)3.2—walks

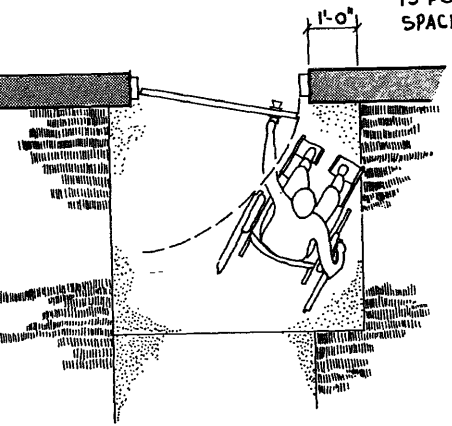
c) All walks provided under (a) and (b) above shall be provided with a l
area no less than *5 feet x 5 feet where they terminate at doors. I*
case shall such walks extend less than 1 foot beyond the side from w
the door opens.

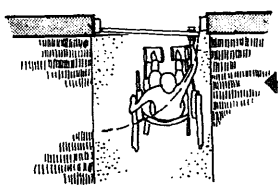
11x3.2(c) WALKS TERMINATING AT DOORS SHALL HAV A 5'-0" x 5'-0" LEVEL PLATFORM EXTENDING 1'-0" TO THE SIDE FRO WHICH THE DOOR OPEN



THE 1'-0" ALLOWANCE TO SIDE OF THE DOOR IS T ALLOW PERSONS IN WHEELCHAIRS TO MOV TO THE SIDE OF THE DO AND OPEN THE DOOR WITHOUT BACKING THE CH

1'-0" DIMENSION HERE IS MINIMAL. WHERE IT IS POSSIBLE, A WIDER SPACE IS MUCH PREFERRED *





HERE, DOOR CANNOT OPENED WITHOUT BACKING THE CHAIR.

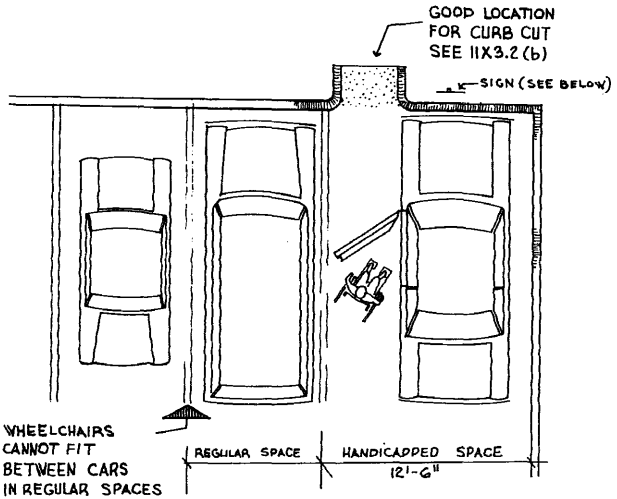
(11x)3.3—parking lots

Parking lots provided for buildings to which Section 1.1 applies shall be provided with parking space as follows:

a) Parking spaces for the handicapped shall be set aside and identified with signs for use by individuals with physical disabilities. The minimum number of assigned spaces shall be as follows:

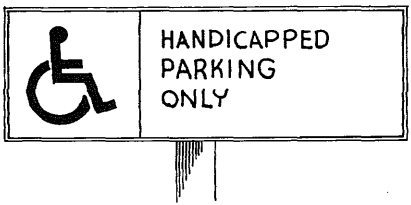
   1) A minimum of one such parking space for the handicapped shall be provided and in addition at least one space per 50 spaces shall be set aside for the handicapped.

b) Parking spaces identified for the physically handicapped that are placed on the diagonal or vertical shall be a minimum of 12 feet 6 inches wide and shall be located as near as possible to the main public entrance of a single building and centrally located where practical in parking lots that serve more than one building.



THE 2% REQUIREMENT FOR HANDICAPPED PARKING SPACES IS 1 IN 50. THIS IS CONSIDERED TO BE VERY MINIMAL & TWICE THIS AMOUNT IS MUCH PREFERRED *.





11x3.3 parking lots

11x3.3(a) 2% OF TOTAL NUMBE OF SPACES OR A MINIMUM OF ONE SHALL BE SET ASIDE & DESIGNATED FOR USE OF PHYSICALLY DISABLED.

SUCH PARKING SPACES SHALL BE CLEARLY MARKED BY SIGNS FOR USE OF HANDICAPPED.

11x3.3(b) HANDICAPPED PARKING SPACES SHALL BE A MINIMUM OF 12'-6" WIDE & LOCATED AS NEAR AS POSSIBLE T BUILDING ENTRANCES OR CENTRALLY LOCATE IN PARKING LOTS BETWEEN BUILDINGS (SEE DESIGNATED WALKWAYS- PAGE 13.)



[11x]4 buildings

(11x)4.1—ramps

Ramps to buildings which Section 1.1 applies to shall conform to the following specifications:

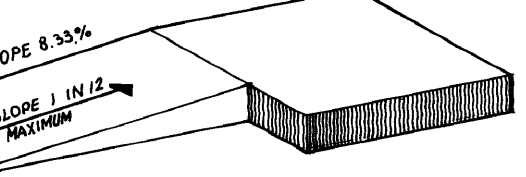
a) A ramp shall not have a slope greater than 1 foot in 12 feet, or 8.33%, and shall be no less than 4 feet clear width and structurally designed to carry a minimum of 100 pounds per sq. ft. live load when free standing.

b) 1) If ramp slopes 5% or less and there is no drop off, no handrail will be required.

2) If ramp slope is greater than 5% up to and including 8.33% and there is no drop off, then one handrail will be required.

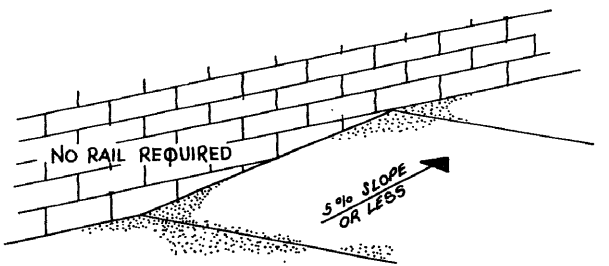
3) Where ramp drops off on one or both sides, handrails are required on both sides of ramp.

4) Handrails where required shall be 32 inches in height measured from the surface of the ramp, and extend 1 foot beyond the top and bottom of the ramp, or turn at right angles.



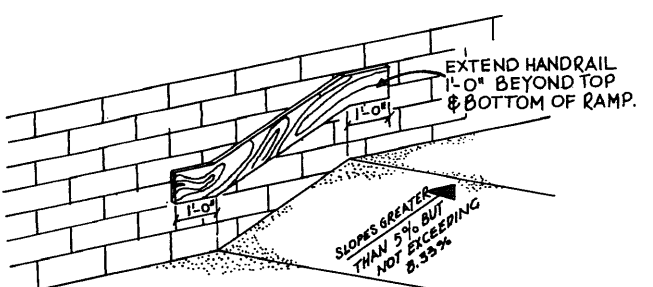
11x4.1 ramps

A RAMP IS DEFINED AS A SLOPING WALKWAY WHICH IS ATTACHED TO A BUILDING AS A MEANS OF MOVING FROM ONE FLOOR ELEVATION TO ANOTHER WITHOUT ENCOUNTERING ANY OBSTRUCTION. (SEE 11x27-RAMPS)

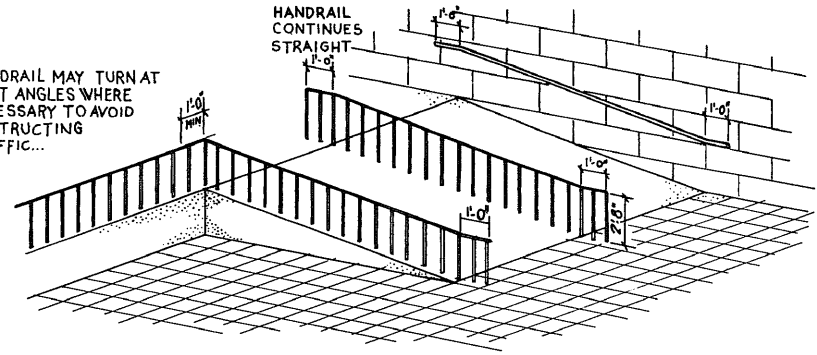


11x4.1(a) RAMP WIDTH MUST BE AT LEAST 4'-0". RAMP SLOPES MUST NOT BE GREATER THAN 8.33% (1" IN 12")

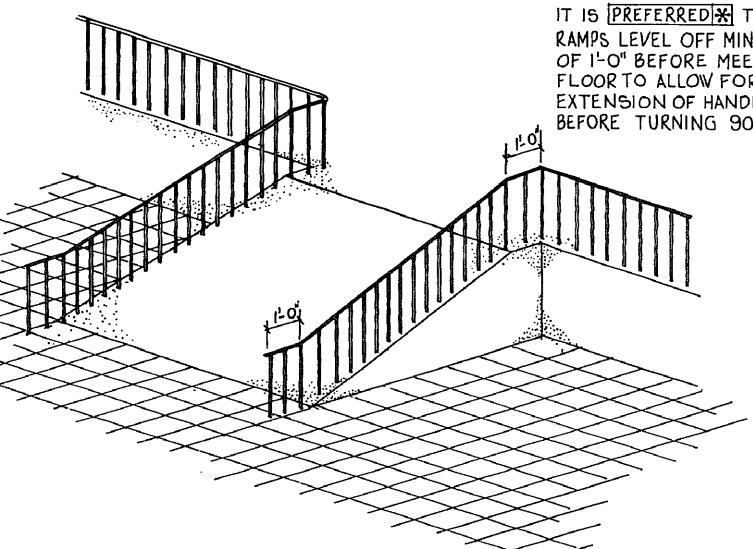
11x4.1(b) IF RAMP SLOPES 5% (1" IN 20") OR LESS, AND THERE IS NO DROP OFF, THEN NO HANDRAIL WILL BE REQUIRED.



11x4.1(b) IF RAMP SLOPE IS GREATER THAN 5%, AND THERE IS NO DROP OFF, THEN ONE HANDRAIL WILL BE REQUIRED. SEE HANDRAIL REQUIREMENTS FOLLOWING.



11x4.1(b) HANDRAILS, WHE
REQUIRED, SHALL
CONTINUOUS, S
BE SMOOTH, SH
32" HIGH FROM TH
SURFACE OF THE
AND SHALL EXT
1'-0" BEYOND
TOP AND BOTTON
THE RAMP, OR TU
AT RIGHT ANGLES
NECESSARY.



IT IS PREFERRED* THAT RAMPS LEVEL OFF MINIMUM OF 1'-0" BEFORE MEETING FLOOR TO ALLOW FOR 1'-0" EXTENSION OF HANDRAIL BEFORE TURNING 90°.

11x4.1(b) WHERE RAMP DROP
ON ONE OR BOTH
HANDRAILS ARE RE
ON BOTH SIDES
RAMP.

(11x)4.1—ramps

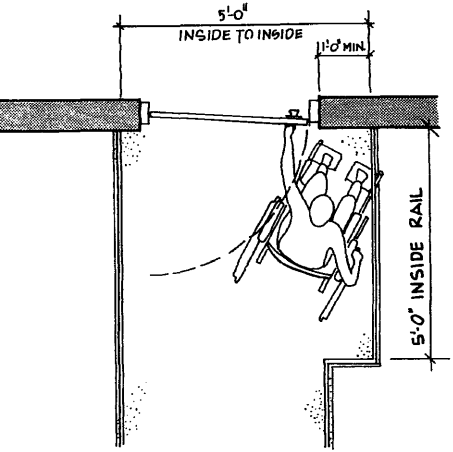
c) A ramp shall have a surface that is non-slip.

d) A ramp shall have a level platform at the top which is at least 5 feet by five feet. This platform shall extend at least 1 foot on the side from which the door opens.

e) Each ramp shall have at least 5 feet of straight level clearance at the bottom.

f) Straight run ramps shall have 3 feet minimum long intermediate level platforms at 30 foot intervals for purposes of rest and safety and shall have level platforms wherever they turn, at least as wide as the ramp and 5 feet long (deep).

HERE RAIL IS REQUIRED AT
ATFORM IT IS PREFERRED *
HAT 5'-0" X 5'-0" BE AN INSIDE
INSIDE RAIL DIMENSION.



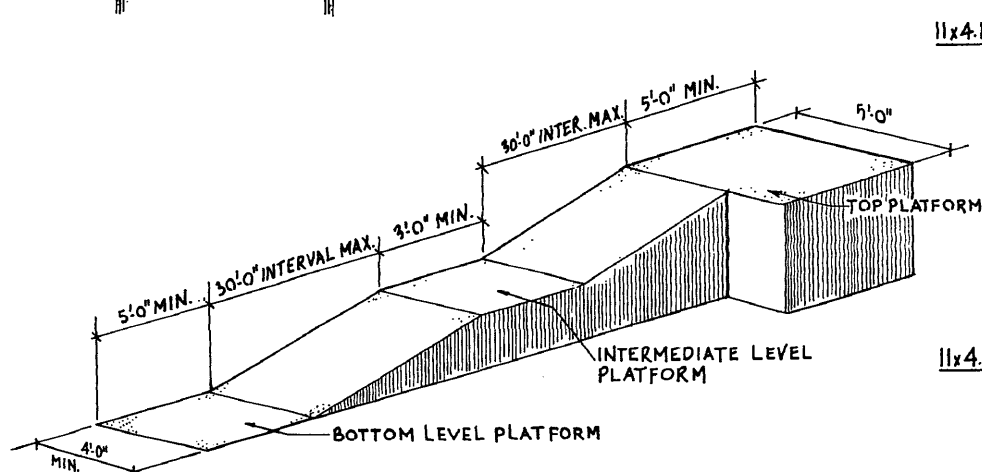
11x4.1(c) RAMPS SHALL H
SURFACES THA
NON-SLIP.

BROOM FINISH CO
CARBORUNDUM GI
RUBBER ARE SUITA
SURFACING MATE

11x4.1(d) RAMPS SHALL H
LEVEL PLATFO
LEAST 5'-0" x 5'-0
SHALL EXTEND
ON THE SIDE F
WHICH THE DOO

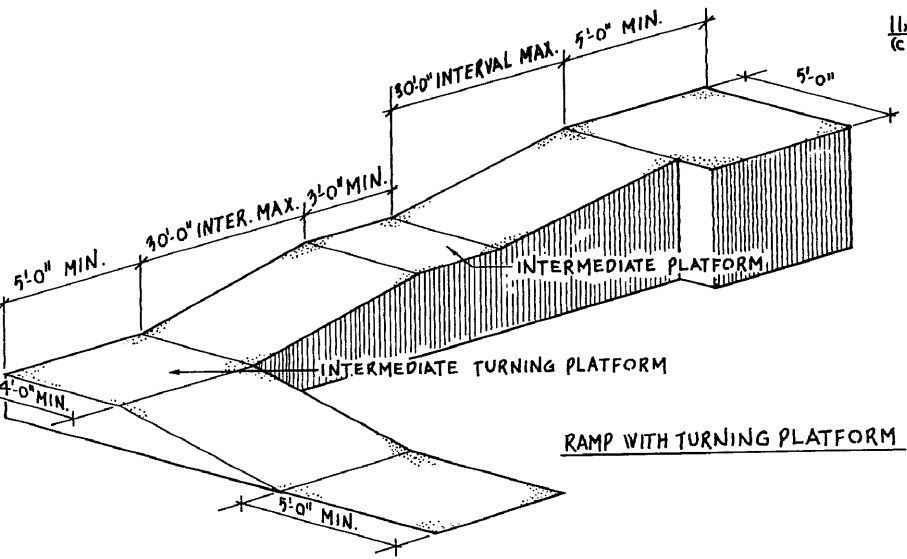
SEE ALSO WALKS

11x4.1(e) RAMPS SHALL HA
LEAST A 5'-0" S
LEVEL SURFAC
THE BOTTOM
ALLOW STOPI
DISTANCE FOR
CHAIRS.

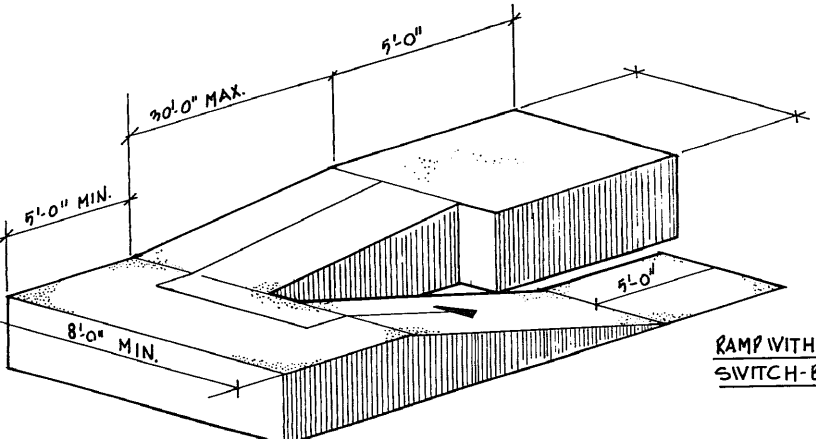


11x4.1(f) RAMPS SHALL H
3'-0" LONG INTE
LEVEL PLATFOR
30'-0" INTERVAL
REST AND SAF

11x4.1(e) (CONT'D) RAMPS SHALL HAVE LE
PLATFORMS WHEREVE
THEY TURN TO ALLO
TURNING & STOPPI
SPACE FOR WHEELCH



RAMP WITH TURNING PLATFORM



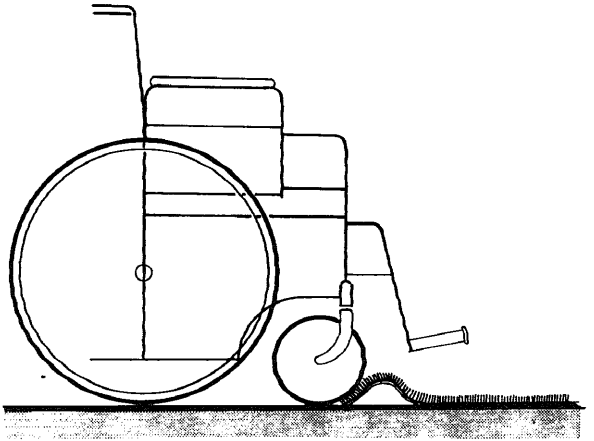
RAMP WITH INTERMEDIATE
SWITCH-BACK PLATFORM

(11x)4.2—entrances

All primary entrances usually considered as major points of pedestrian flow to buildings which Section 1.1 applies to shall be usable by the physically handicapped. An entrance to be usable by the physically handicapped must be approached by a continuous common surface (see 11x3.2 walks; 11x4.1 ramps; and 11x4.5 floors), and have wide doors operated by a single effort (see 11x4.3 doors).

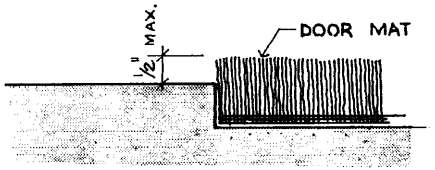
11x4.2 entrances

AN ENTRANCE TO BE USABLE BY THE PHYSICALLY HANDICAPPED MUST BE APPROACHED BY A CONTINUOUS COMMON SURFACE (SEE 11x3.2-WALKS, 11x4.1 RAMPS, & 11x4.5 FLOORS), AND HAVE WIDE DOORS OPERATED BY A SINGLE EFFORT (SEE 11x4.3-DOORS).

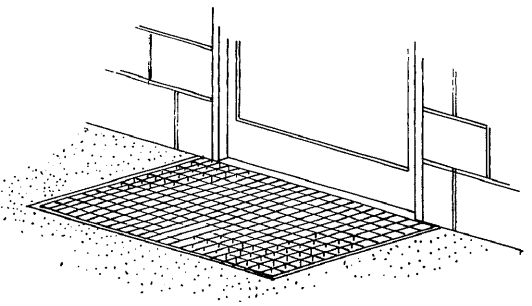


[*] PREFERRED DOOR MATS & GRATES SHOULD NOT BE BARRIERS

THICK BRISTLY DOOR MATS OF HEMP OR PLASTIC BUNCH UP UNDER SMALL WHEELS OF CHAIRS PRESENTING A FORMIDABLE BARRIER. OFTEN MATS ARE THICKER THAN THE ½" MAXIMUM ALLOWABLE VERTICAL LEVEL CHANGE (SEE 11x3.2 (b)) WALKS).



THICK DOOR MATS (GREATER THAN ½") SHOULD BE RECESSED INTO THE SURFACE AT LEAST ½ THEIR THICKNESS OR THIN MATS OF WOVEN RUBBER SHOULD BE USED.



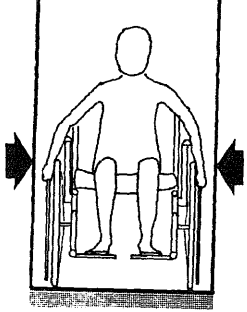
GRATES AT DOORS FOR SNOW AND SAND TRAPS SHOULD BE AVOIDED UNLESS THE MAXIMUM GRID OPENING IS NO MORE THAN 3/8" x 3/8". LARGER OPENINGS ARE HAZARDOUS TO THOSE WITH CRUTCHES AND CANES AND MAKE WHEELCHAIR TRAVEL EXTREMELY DIFFICULT.



(11x)4.3—doors and doorways

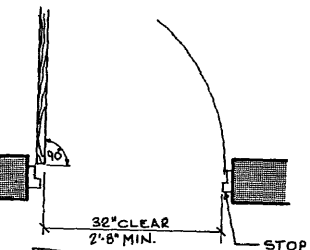
Exterior and interior passage doors for buildings which Section (11X)1.1 applies to shall comply with the following requirements:

a) Exterior and interior passage doors shall have a clear opening of no less than 32 inches when the door is open and shall be operable by a single effort with one hand. Two-leaf doors are not usable unless they operate by a single effort, and one of the two leaves meets this requirement.



AN ADULT WHEELCHAIR AVERAGES 27" WIDE. THE REQUIRED 32" CLEAR DOOR WIDTH ALLOWS 2½" CLEARANCE ON EACH SIDE FOR HANDS.

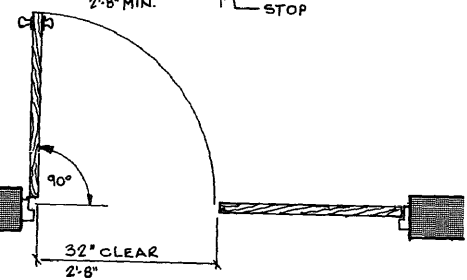
11x4.3(a) MUST HAVE A C
OPENING OF
MINIMUM.



CLEAR OPENING MUST BE BETWEEN THE DOOR IN ITS 90° OPEN POSITION & THE FACE OF THE STOP.

11x4.3(a) TWO LEAF DO
HAVE ONE LEAF
AFFORDS THE
32" CLEAR OP

REVOLVING DOORS
TURNSTILES SHOU
BE USED UNLESS
DOORS ARE PLAC
IMMEDIATELY BES



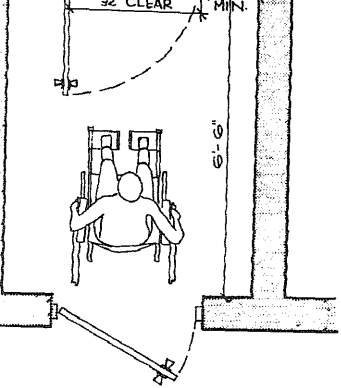
CLEAR OPENING FOR TWO LEAF DOORS MUST BE BETWEEN EITHER DOOR IN ITS 90° OPEN POSITION & THE EDGE OF THE OTHER DOOR.

11x4.3(a) ALL DOORS MU
WITH A SINGLE
ONLY ONE DOO
SHOULD BE PUS
WITH ONE HAND
A 32" OPENING.

(11x)4.3—doors and doorways

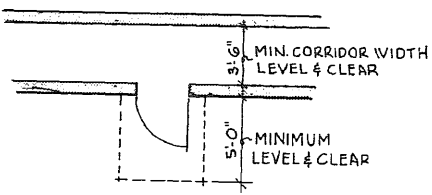
b) Distance between two doors (e.g. outer and inner) must be a minimum of 6 feet 6 inches.

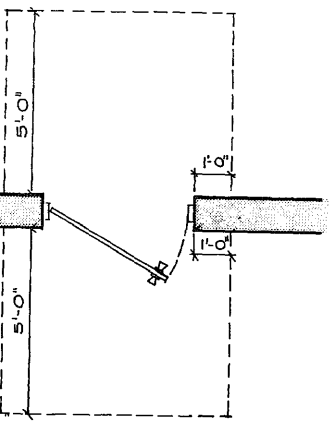
c) The floor on the inside and outside of each doorway shall be level and clear for a distance of 5 feet from the door and shall extend one foot beyond the side from which the door opens.



6'-6" SPACE IS NECESSARY TO ALLOW BACKING & TURNING SPACE FOR A WHEELCHAIR TO CLEAR THE INSWINGING DOOR.

WHERE DOORS OPEN ONTO, BUT NOT INTO CORRIDOR, THE REQUIRED LEVEL FLOOR BEYOND THE DOOR MAY BE THE MINIMUM 42" CORRIDOR WIDTH.





5'-0" AREA MUST BE LEVEL TO PREVENT WHEELCHAIRS FROM ROLLING WHEN THE OCCUPANT RELEASES THE WHEEL GRIPS TO REACH FOR DOOR HANDLE.

DOORS MUST BE AT LEAST 6'-6".

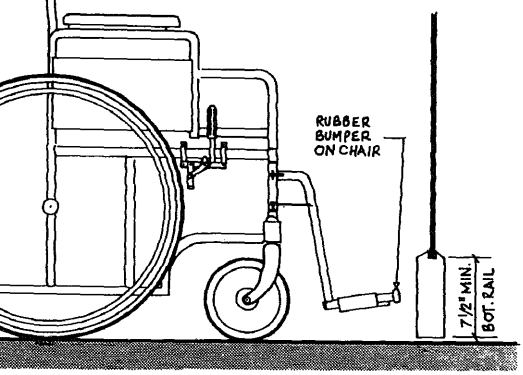
11x4.3(c) THE FLOOR ON THE INSIDE & OUTSIDE OF EACH DOORWAY SHALL BE LEVEL AND CLEAR FOR A 5'-0" DISTANCE FROM THE DOOR, AND SHALL EXTEND 1'-0" TO THE SIDE OF THE DOOR ON THE SIDE OPPOSITE THE HINGES. THIS 1'-0" EXTENSION MUST OCCUR ON BOTH THE INSIDE AND OUTSIDE OF THE DOOR.

(SEE 11x 3.2(c) WALKS)

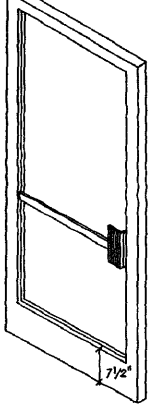
(11x)4.3—doors and doorways

d) Where narrow stile frame glass doors are used, the bottom rail shall be a minimum height of 7½ inches. Standard narrow frame doors may be used provided glass is protected to a height of 7½" by an applied panel cr insert to provide an adequate pushing surface for wheelchair bumpers.

e) Exterior thresholds shall be beveled with a maximum edge height of ¾ inches. Interior thresholds shall be flush with the floor, or beveled at not more than 5% slope with a maximum edge height of ½ inch.

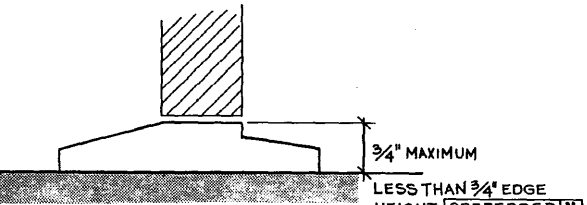


TTOM RAIL OF GLASS DOORS MUST BE
RGE ENOUGH TO ALLOW RUBBER BUMPERS
N CHAIRS TO PUSH THEM OPEN WITHOUT
TTING GLASS OR SCREENING. RAIL
IOULD HAVE SMOOTH SURFACE TO
LLOW BUMPER TO SLIDE ALONG.

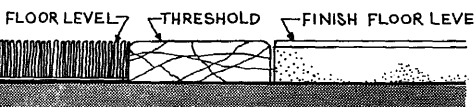


GLASS DOORS M
AT LEAST 7½"
STANDARD NARR
FRAME DOORS MA
USED PROVIDED
IS PROTECTED TO
OF 7½" BY AN A
PANEL OR INSER
PROVIDE AN ADI
PUSHING SURFA
WHEELCHAIR BU

11x4.3(e) THRESHOLDS AT
EXTERIOR DOOR
BE BEVELED AND
MAXIMUM EDGE H
OF 3/4".



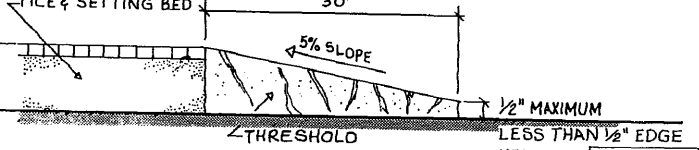
THRESHOLDS AT
INTERIOR DOOR
BE FLUSH WITH F
OR SLOPED AT N
THAN 5% AND HA
MAXIMUM EDGE
OF ½".

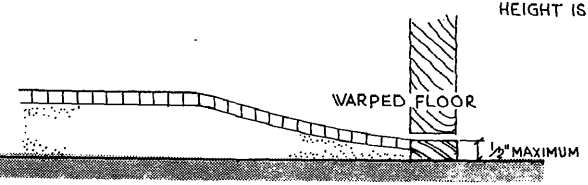


(11x)4.3—doors and doorways

f) Where door closers are used, the pressure to open a door should exceed a maximum of 15 pounds. The lightest possible door pressure use of handicapped people is preferred.

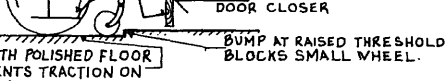
g) Corridors which serve the above doorways shall be no less than 42' width.



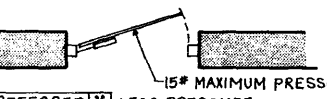


WHERE THE FLOOR IS WARPED AT 5% SLOPE, 5'-0" LEVEL FLOOR AS REQUIRED IN 4.3(c) MAY BEGIN AT THRESHOLD.





PROBLEM: THE CONDITION ABOVE OFTEN MAKES "HANDICAPPED" TOILET ROOMS INACCESSIBLE TO WHEELCHAIRS.



11x4.3(e) (CONT'D) WHERE FLOOR LEVEL CHANGE, AS IN TOIL ROOMS WHERE TILE BEDS RAISE THE FLO LEVEL, THE REQUIRE SLOPE RESULTS IN THRESHOLD.

TO AVOID THIS SITU IT IS RECOMMENDE EITHER THAT THE TO ROOM FLOOR BE W DOWN, OR THAT THE ROOM FLOOR BE DE IN CONSTRUCTION.

11x4.3(f) PRESSURE TO OPEN WITH CLOSERS SH NOT BE MORE THA POUNDS.

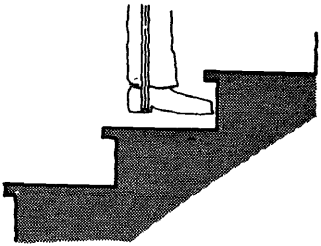
PREFERRED * TIME DOOR CLOSERS WHI DOOR OPEN FOR UP SECONDS, AND AUT POWER OPERATED SLIDING OR PIVOTIN BOTH STRONGLY RECOMMENDED AT ENTRANCES, MAJOR DOORWAYS AND TO ROOMS.

11x4.3(g) CORRIDORS MUS NO LESS THAN 4 WIDE.

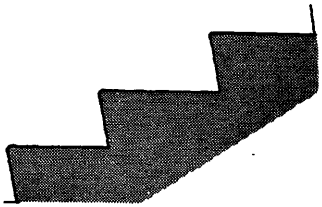
(11x)4.4—stairs

Stairs shall conform to Section 1115 and in buildings which Sectio
applies to, the following additional requirements shall be met:

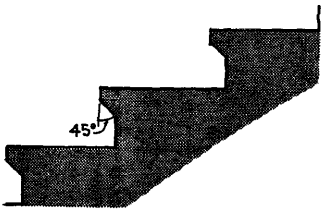
a) Steps in stairs shall not have abrupt (squared) nosing. One inch ro
nosing is acceptable.

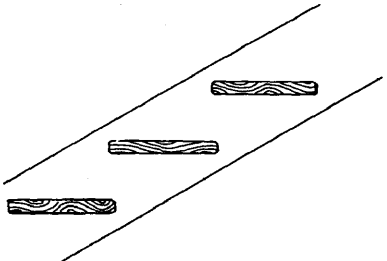


UNACCEPTABLE STAIR
PERSONS WEARING LEG BRACES OFTEN TRIP BECAUSE THEY CANNOT DROP THE TOE TO CLEAR THE STAIR NOSING.



ACCEPTABLE STAIRS
WITH VERTICAL OR SLANTED RISERS.





OPEN RISER STAIR
THE CODE IS INTENDED TO PROVIDE SAFE & ADEQUATE STAIRS FOR HANDICAPPED PEOPLE & IS NOT INTENDED TO ELIMINATE DECORATIVE OPEN RISER STAIRS, WHICH, FOR THE REASONS STATED ABOVE, ARE A HAZARD TO PERSONS WEARING LEG BRACES.

HOWEVER, OPEN RISER STAIRS, WHERE ALLOWED BY OTHER SECTIONS OF THE BUILDING CODE, SHOULD NOT BE PROHIBITED IN BUILDINGS WHICH HAVE, ON THE SAME FLOOR, RAMPS, STAIRS, OR ELEVATORS THAT COMPLY WITH THE CODE.

11x4.4 stairs

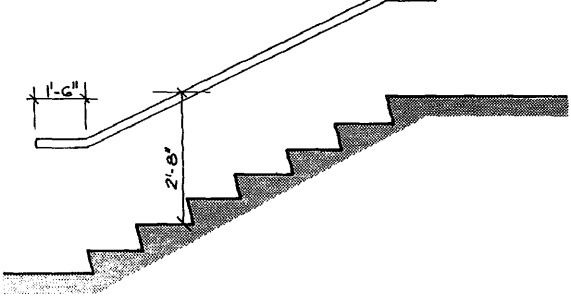
STAIRS MUST COMPL
SECTION 1115 AND
FOLLOWING.

11x4.4(a) STEPS IN ST
NOT HAVE AB
(SQUARED) NO

(11x)4.4—stairs

b) Stairs shall have at least one continuous handrail 32 inches as measured from the tread at the face of the riser.

c) Stairs shall have at least one continuous handrail that extends at least 18 inches beyond the top step and beyond the bottom step or turned at right angles. Care shall be taken that the extension of the handrails is not in itself a hazard and the extensions should be made on the side of a continuing wall.

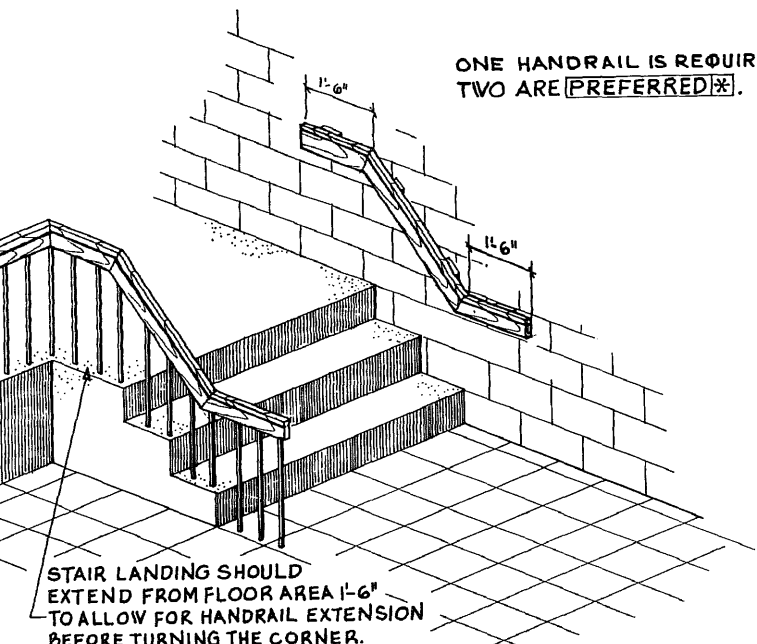


LEAST ONE
CONTINUOUS HA
32" ABOVE THE T
MEASURED AT TH
OF THE RISERS.

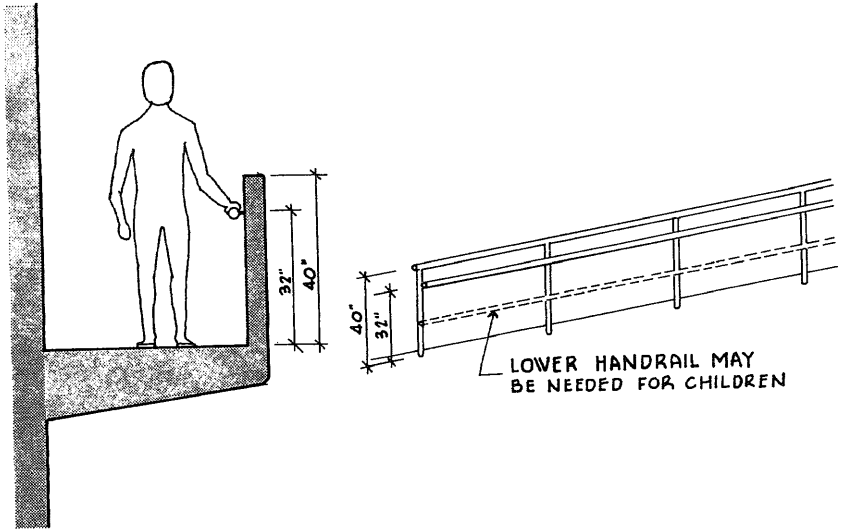
11x4.4(c) STAIRS SHALL
AT LEAST ONE
CONTINUOUS
HANDRAIL WHICH
EXTENDS 1'-6" B
THE TOP & BOT
OF THE STAIR
TURNS AT RIGH
ANGLES.

CARE SHALL B
TAKEN THAT T
EXTENSION
HANDRAILS IS N
ITSELF A HAZA
AND THE EXTE
SHOULD BE ON
SIDE OF A
CONTINUING

ONE HANDRAIL IS REQUIRED,
TWO ARE PREFERRED *.

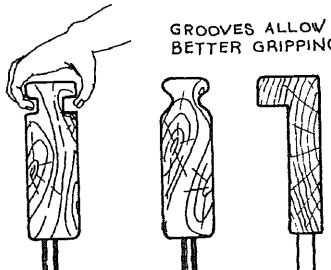


OF THE CODE REQU
RAILINGS TO BE 40"
AS AT BALCONIES,
AUXILIARY HANDRAI
MUST BE INSTALLE
32" ABOVE THE FLO





WHERE NARROW, DEEP HANDRAILS ARE USED, CONSIDERATION SHOULD BE GIVEN TO SHAPING HANDRAILS SO AS TO PROVIDE EASIER GRIP FOR PERSONS WITH LIMITED GRIPPING POWER.



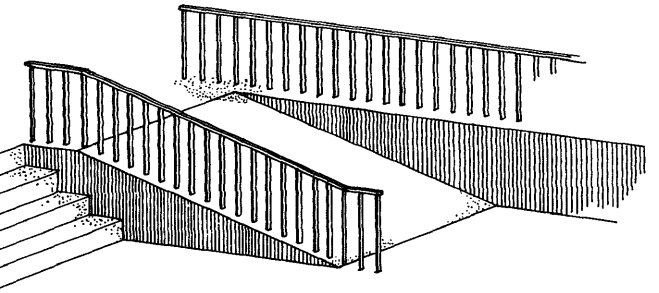


(11x)4.5—floors

a) Floors on a given story shall be a common level throug
nected by a ramp in accord with (11X)4.1(a) through (11)
except that thresholds meeting requirements of 4.3(e) may
balconies and bleachers are not required to conform to this

EXAMPLE 1: There shall not be a difference between the lev
a corridor and the level of the floor of the toilet rooms, unle
are provided. Consideration should be given to depressing
struction if ceramic tile is used to provide for common level.

EXAMPLE 2: There shall not be a difference between the lev
a corridor and the level of a meeting room, dining room, or
unless proper ramps are provided.



LOWERED FLOOR AREA MUST HAVE RAMP ACCESS. SEE 11x4.1

11x4.5 floors

11x4.5(a) FLOORS ON A GIVEN STORY SHALL BE A COMMON LEVEL THROUGHOUT OR BE CONNECTED BY A RAMP IN ACCORDANCE WITH 11x4.1 (a-f).

STAGES, BALCONIES & BLEACHERS ARE NOT REQUIRED TO MEET THIS REQUIREMENT (EXCEPT IN FEDERALLY FUNDED PROJECTS. SEE PUBLIC LAW 90-480)

EXAMPLE 1: SEE 11x4.3(e) DOORS PAGES 39-41

EXAMPLE 2: SEE ABOVE

WHERE SMALL RAISED PLATFORM SEATING IS PROVIDED WITHIN A ROOM FOR SPECIFIC FACILITIES, AS IN RESTAURANTS AND LOUNGES, PLATFORMS NEED NOT BE ACCESSIBLE TO WHEELCHAIRS IF THE SAME FACILITIES ARE AVAILABLE AT THE MAIN FLOOR LEVEL IN THE SAME AREA. HOWEVER IT IS PREFERRED* THAT SOME OF THESE PLATFORMS BE ACCESSIBLE.

MAKING FACILITIES ACCESSIBLE TO THE PHYSICALLY HANDICAPPED



MAKING FACILITIES ACCESSIBLE TO THE PHYSICALLY HANDICAPPED

TATE UNIVERSITY CONSTRUCTION FUND
LBANY, NEW YORK, JULY 1967

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This training program was made possible by training gra
No. 651-T-67 from Vocational Rehabilitation Administratio
Department of Health, Education and Welfare, Washington, D.

Additional copies of this publication and informatio
pertaining to a film of the November 1966 Seminar on Makin
Facilities Accessible to the Physically Handicapped ar
available from the State University Construction Fund, 19
Washington Avenue, Albany, New York 12210.

Paragraphs printed in color in italic type at the foot of variou
pages are quotations from the proceedings of the November 196
Seminar.

FOREWORD

The State University Construction Fund is engaged
a continuing research program to develop Performance
riteria for the physical facilities of State University.
is the Fund's intention to promote, by means of Per-
rmance Criteria, an understanding of the broad princi-
es, policies and requirements on which are based the
lanning, design and construction of these facilities.

More specifically, the objectives of these Perform-
nce Criteria are:

To provide an objective basis for the Fund's ap-
oach to planning, design and construction, and for
nd approval of design submissions;
olish a system of communication by means
owner can make his preferences known to
members of the building industry team and still allow
em sufficient flexibility to utilize available resources
fectively;

To create an administrative environment favorable
the development of design solutions, construction
chniques and materials and products that respond to
e functional and economic requirements of individual
ojects; and

To document and make available the current signifi-
nt results of research and experience in the building
dustry, particularly with respect to the Fund's pro-
am.

The Fund Performance Criteria serve only to establish
nimum guidelines and to define adequately the per-
rmance requirements for State University physical fac-
ties, in terms of the total program of education objec-
es and the objectives of function, environment and
intenance and operation. The aim is not to establish
rrow limitations, but to provide the owner with a useful
tool for evaluating performance in areas of vital conc
to him.

The Performance Criteria for the Physically Har
capped were developed with the help of a grant from
Vocational Rehabilitation Administration of the Uni
States Department of Health, Education and Welfa
By collaboration with universities and with profession
of nation-wide reputation in physical rehabilitation—a
by sponsoring and conducting an industry-wide semin
the Fund has developed a guide that reflects and inc
porates the best known practices in establishing edu
tional environments favorable to the handicapped, wh
remaining cognizant, at the same time, of the owne
needs and problems.

The Fund does not intend these Performance Crite
to degenerate into static requirements. Rather, they
be continually evaluated to assure their relevance
the needs and requirements of the handicapped and
keep pace with new developments in planning, des
and construction. It is anticipated that, by stating
quirements as much as possible in performance langua
these criteria will continue to be useful for a lon
period than would be the case were they stated as sp
fications dictating or prescribing specific solutions
design and construction problems.

The universities, the design professions, the ma
ials and product manufacturers and the building c
tractors are encouraged to achieve, through these
teria, an understanding of the needs of the handicap
and to translate this understanding into university
vironments in a practical, economical and creative w
to open for the handicapped an ever-widening vista
educational accomplishment.

*live in today's modern world through education and it's particu-
ly important with these young people that they have the chance
that education because they, of all people, are limited to the
owledge in their heads, and their ability to communicate that*

INTRODUCTION

In the past, architects have been content when the ildings they have designed have functioned satis-storily with respect to "the average man." Unaware the large numbers of the physically handicapped iving to make their way in the world as functional d productive citizens, architects have often inadvert-tly designed and built into their buildings elements at act as environmental restrictions to the handicapped. nce this guide, which, first, seeks to analyze and plain some of the difficulties encountered by the ysically handicapped in attempting to enter and move out functionally within college campuses and build-gs, and, second, sets forth some of the design and uipment considerations offered by professionals in e field of physical rehabilitation.

Access to existing and future New York State-owned ildings is being provided physically handicapped per-ns through a program initiated by Governor Nelson A. ckefeller in an executive order dated June, 1961. e Governor's program, based on recommendations of e Governor's Council on Rehabilitation and The Inter-partmental Health and Hospital Council, has required t State buildings be designed and constructed, or dified, where necessary, to facilitate their use by e physically handicapped.

Under this program, State University facilities are ing so constructed or modified that provision is made the handicapped to obtain for themselves the great-t possible benefit from higher education at State iversity campuses and thus more closely approach lization of their full potential as productive indivi-als in our society.

Since the handicapped should, as far as possible, rticipate in the broadest range of campus activities ually with those not handicapped, it is imperative that the entire campus be brought into considera and not for the benefit of the handicapped student c but also for State University staff and campus visi with permanent or temporary physical handicaps or sight, hearing, cardiac or respiratory disabilities.

Facilities designed to serve the handicapped serve the non-handicapped. Able-bodied people fin easier to get around, and maintenance is facilita lowering operating cost.

Intelligent planning avoids extra expense, sinc facility constructed from the outset with the probl of the handicapped in mind need cost little if any r than a similar facility planned without these consid tions.

Ultimately, the long-range societal value of hig trained and skilled handicapped people more than sets the comparatively slight design and construc costs attributable to a response to the needs of handicapped.

Among the professionals and other authorities have collaborated with the Fund to make these Crit comprehensive, authoritative and valid, are:

Dr. Timothy J. Nugent, Director of the Rehab tation-Education Center at the University of Illin a member of the President's Committee on Employm of the Physically Handicapped, of the National Rehab tation Association, of the National Vocational Guida Association and of the American Personnel Guida Association. Dr. Nugent has published many artic and brochures on the acceptance of handicapped stude in the University environment, pioneering in the mo ment to make facilities available to them.

Martin Feldman, Project Coordinator for the Hu Resources Research and Training Institute, an organi tion set up as the research division of Abilities, Inc.

, New York. This institute is working on a
lating to the education of physically disabled
under a grant from the U. S. Office of Educa-

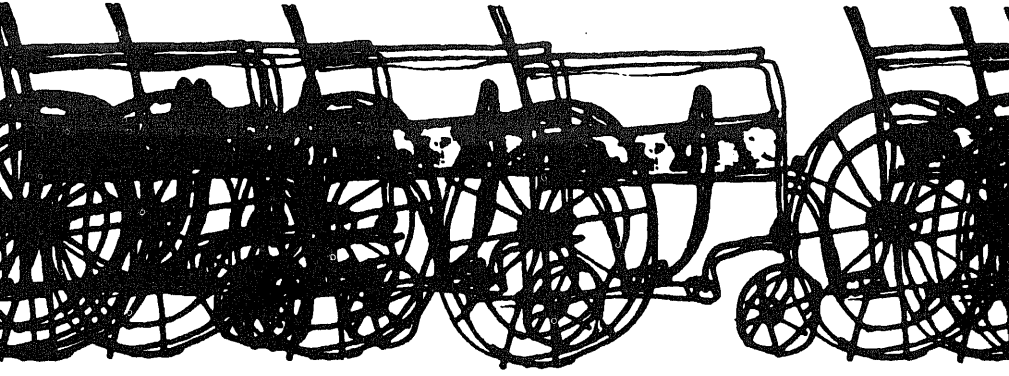
Levy, Assistant Commissioner of Education
ional Rehabilitation, New York State Depart-
Education, and active for many years in voca-
abilitation programs at both national and state
e has served in elective and appointive posi-
nany of the associations dealing with rehabili-
d guidance, and is a member of the Advisory
Rehabilitation Counselor Training and of the
ation Advisory Committee to the New York
kmen's Compensation Board.

lfred Cohn, Coordinator of the Program for
ucation for the Disabled at Hofstra University.
een working under a grant from the Vocational
ation Administration to make that University
e to the physically handicapped.

E. Schnebly and Muriel E. Zimmerman, respec-

tively Director and Associate Director of Occupational Therapy of the Institute of Rehabilitation Medicine, New York University, and Edith Buchwald Lawton, Director of Postgraduate Education for Paramedical Personnel of the same Institute. Familiar with problems of the handicapped, worldwide, they were instrumental in the conception and design of a structure, known as "Horizon House", which would provide accessibility and living convenience for the handicapped.

Dr. Joseph Fenton, Chief of the Division of Research and Training Centers of the Vocational Rehabilitation Administration of the Department of Health, Education and Welfare; until recently, Special Assistant to the New York State Interdepartmental Health and Hospital Council; and, since 1960, Special Assistant to the Governor's Council on Rehabilitation, directing the development of the "Master Plan" for rehabilitation in New York State. Dr. Fenton, has had a long and active career in his special field, and authored many reports and professional publications of interest and value to those ac-



vely concerned with providing educational opportunities or the handicapped.

Thomas Eldridge, School Specialist with the E. F. auserman Company. While with the Dormitory Authority f the State of New York, he performed the principal esearch in the field of dormitory and dining hall ac-essibility for the handicapped.

Additional thrust and meaning were supplied by the arlier pioneering efforts of such dedicated people as:

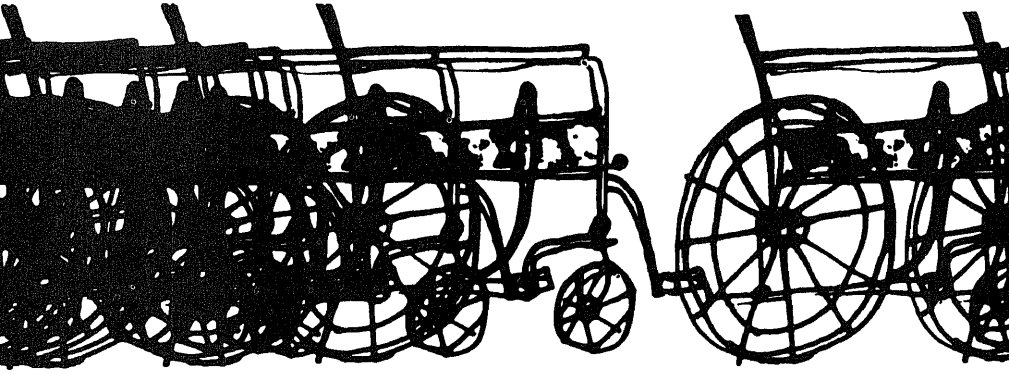
Henry Viscardi, founder of Abilities, Inc., pioneer n the field of rehabilitation of the physically handi-apped. He has been instrumental in bringing about reater public awareness of the abilities of the handi-apped.

Eugene J. Taylor, Adjunct-Associate Professor of hysical Medicine and Rehabilitation, New York Uni-ersity, School of Medicine; Consultant to the Voca-onal Rehabilitation Administration, to the Human esources Center and to the Health Resources Advisory ommittee. Dr. Taylor's writings are of importance to those seeking to meet the requirements in educati opportunity for the handicapped.

Dr. Howard A. Rusk, M.D. Professor and Cha of the Department of Rehabilitation Medicine, New University. Dr. Rusk is one of the foremost autho in the field of rehabilitation.

Leon Chatelain, Jr., a member of the Exec Committee of the President's Committee for Emplo of the Handicapped. His international reputation architect has not diverted him from contributing k ledge and time in service for the handicapped; he long been associated with committees and organiza concerned with solving problems in this field.

The Honorable Mary Switzer, Commissioner of V tional Rehabilitation. She encouraged the develop of Fund Criteria and the preparation of this book b personal counsel and through the award of a grant made possible much of the research and the public of the Criteria, in quantity.



THE HANDICAPPED

An estimated 2.5 million New Yorkers are in some ay limited in their ability to move about and use public cilities. People in wheelchairs, or with leg braces and tificial limbs; individuals suffering from heart condi-ons, and those who are blind and aged find that flights stairs, curbs, revolving doors, out-of-reach drinking untains and telephones, narrow doorways and inadequate st room facilities and other similar restrictions tend deny them free access to buildings in which they herwise might pursue valuable business, vocational, ducational, social and recreational objectives.

Statistics of the National Safety Council indicate a arly increase in the number of persons becoming dis-led due to a wide variety of accidents. Millions of llars have been spent in rehabilitating the handi-pped so that they may become self-supporting and oductive members of our society. Every year, auto-bile and industrial accidents, strokes, arthritis, nerve sorders, cardiac problems, old age and many other oblems add to the list of handicapped. Those with rmanent disabilities are often taught, through inten-e rehabilitation, to overcome ordinary obstacles. wever, a large portion of our population of the handi-pped, who become temporarily disabled through frac-es of the lower limbs or through surgery, present a ecial problem because they usually have recovered m their handicap by the time they have learned to e successfully with it. Consequently, as far as the use of facilities is concerned, these people are m handicapped, during the period of their disability, t are those who are permanently disabled.

Despite the individual and specific effect of a ha cap, certain general planning considerations must taken into account if facilities are to be made accessil Most basic is the need to provide wheelchair users other handicapped pedestrians with access to and e of movement to and within the exterior and interior spa of any facility, and to make the use of equipment conveniences possible to them. In planning, two m types of handicaps are to be considered:

- The ambulant and semi-ambulant--including pers with crutches or walking sticks, the blind, individu with cardiac conditions, and the deaf.
- Paraplegics, amputees and hemiplegics--all of wh are handicapped in the upper and/or lower extremi to an extent which usually dictates their confinem to a wheelchair.

The wheelchair with its different mode of movem requires the most stringent standards with respec clear spaces, grades, the size of openings, and the cessibility of equipment and conveniences. Theref the criteria set forth in this publication are largely voted to the needs of wheelchair users, not meanin create an effortless atmosphere for them or for o handicapped, but rather to provide environmental as tance.

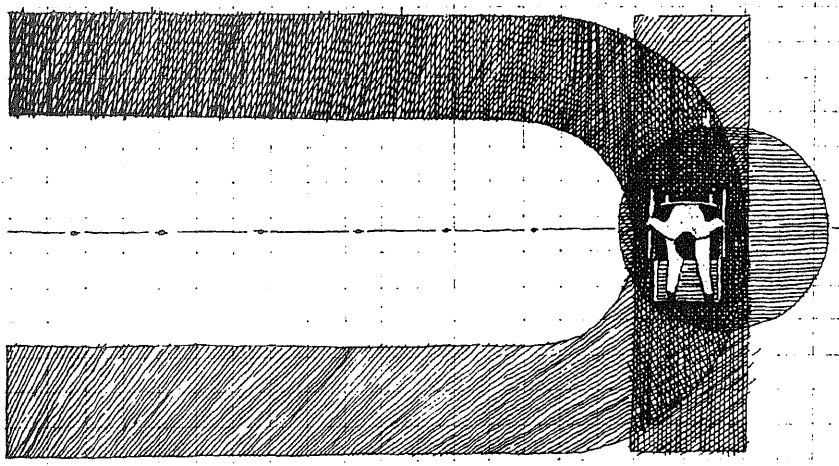
THE NEW DIMENSION

The "average man" has been the prime concern of esigners for centuries. The products, equipment and nvironments of the world have been designed in re- ponse to his needs and desires--his efficiencies and efficiencies. Now he has a rival. New attitudes towards he physically handicapped and new techniques of herapy and prosthesis have added a new dimension to uman life and, thereby, a new unit to challenge the esigner--the man in a wheelchair.

In a wheelchair a man's height is decreased by one- hird--his width is doubled. His reach is limited by his ability to get his body into close proximity with ob- jects, because of the way the wheelchair is constru He needs more room to carry on normal everyda tivities. He cannot climb steps. He can go forwar backward at will, but cannot move abruptly to either

To travel in a straight line he needs a path feet wide, and he needs almost five feet of str travel before he can negotiate a turn. Twenty-s square feet of clear area are needed to permit h turn about.

This is the new entity to be considered when id fying and solving exterior and interior design prob



EXTERIOR

. ENTRANCES

At least one main or principal entrance is to be rovided at grade level for each building that must be ccessible to the handicapped, in accordance with the rogram. In multi-level buildings, this entrance is to be cated on a floor serviced by an elevator.

Approaches to the designated entrance are to be ee of steps and as level as possible, since many heelchair users are unable to negotiate steep grades, dependently. Slopes at these entrances should be kept ithin the acceptable gradient limit of 5 per cent.

RAMPS

A ramp should be provided wherever it is not posble to have a principal entrance at grade level, due unusual site or other conditions. The ramp surface ould be of non-slip material having a high coefficient friction. Ramps more than 30 feet long should be ovided with an intermediate, level, rest platform at ast 4 feet 6 inches in length.

The approach to a ramp should be level and at least eet long. Where the top of a ramp enters the building, re should be a level platform large enough to accommodate circulation, allow doors to swing out, and p vide wheelchair rest space; the platform width sho be a minimum of 5 feet, and it should extend at le 1 foot beyond the door opening on each side. Handra should be provided wherever there are significant dr from, or grades away from ramps or platforms.

• Ramp Gradients. For the safety of the able-bodied well as the physically handicapped, the grade of a ra should not exceed 8 per cent. Where the gradient o ramp does exceed this maximum, a number of additio requirements must be met. The ramp must be wide eno to accommodate normal traffic and contain, as well curbed aisle 30 inches wide. Such an aisle enable wheelchair user to stop quickly a wheelchair that is of control, by braking one wheel, turning the chair gainst one of the curbs. Curbs should be at leas inches high and 4 inches wide to provide effect control. Handrails 32 inches high should also be p vided on both sides of ramps for their full length. Ran in exposed locations should be covered by canop and/or provided with built-in electric cables or ot snow-melting devices, to prevent the ramp surface fr becoming slippery.

The so-called 'service entrances' are not a desirable means of and-out movement of the handicapped. This type of entrance plies a movement of inanimate objects, supplies and so forth, that wherever possible the use of that kind of access should avoided.

--Adrian Le

I would emphasize that the one foot in twelve feet that is spe

Handrails 32 inches high should be located on both
es of the stairs. All rails should be uninterrupted for
full length of the stairs, and should extend 30 in-
es on the level, at top and bottom.

Exterior stairs should be well lighted at all times.

DOORS

All entrances designated to be used by the handi-
pped are to have doors providing a minimum clear
ening of 3 feet, and operating manually, by power,
with power assistance.

Power-operated or power-assisted doors may be elec-
cally, hydraulically or pneumatically operated. Their
ximum closing tension must not exceed 8 pounds,
en under conditions of power failure.

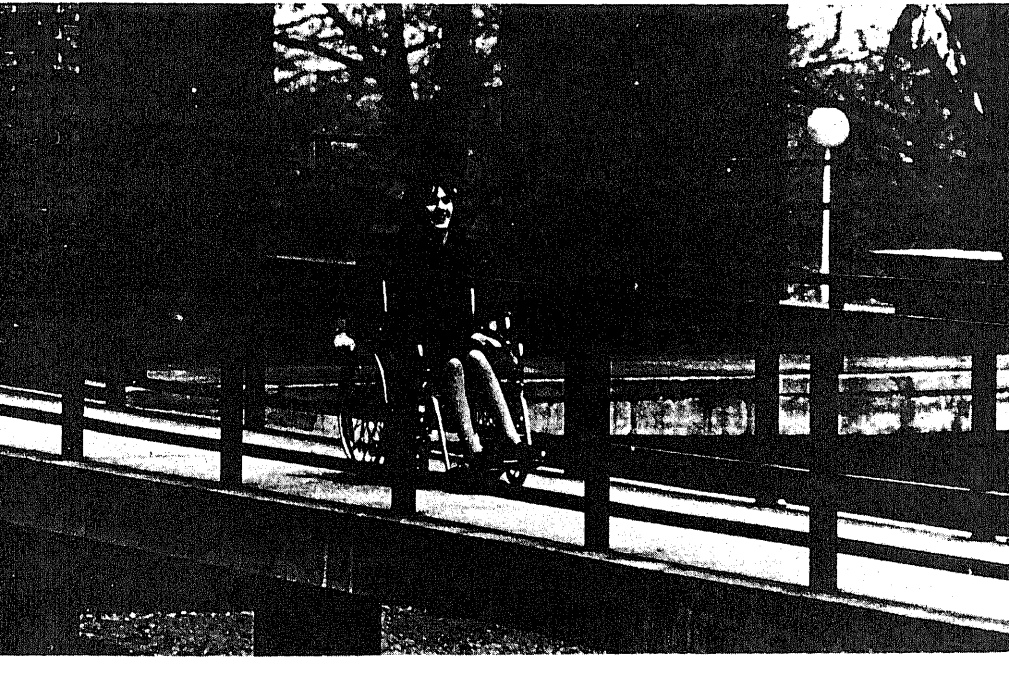
The most suitable triggering device for power-
erated doors is the pressure-sensitive contact floor
t, which opens the door and holds it open as long as
mat is occupied on either side of the door opening.
me-lapse devices that close doors automatically
er a prescribed delay are considered hazardous to
eelchair users and the slow-moving, semi-ambulatory

system. Although the natural barrier of steep grades,
the presence of unavoidable man-made obstacles
militate against achieving an ideal solution, a rea
fort to minimize hazards and barriers can produ
workable situation in most cases.

Pavement materials for major walks should be
and firm, not slippery when wet. Joints should be
and filled. Unsealed gravel surfaces and cobbles
to be avoided.

Circulation routes with gradients of 3 per ce
less can be negotiated without great difficulty by wh
chair users. It is of primary importance that major pe
trian walks be kept within this gradient limitation
all possible. Routes with gradients of from 3 to 5
cent can be negotiated independently, but with
culty that increases with distance.

An occasional level rest area in the midst of
stretches at this gradient is a help; frequent level
areas become a "must" if the gradient exceeds 5
cent.



INTERSECTIONS

Where walkways intersect other walkways or roads at are constructed at different elevations, the surces should be made to blend by means of a ramp, for e benefit of wheelchair users. This requires design eatment of the curb, which not only constitutes a afety feature for all, on roadways, but also represents safety signal for the blind.

One acceptable solution is that of dropping the curb the level of the roadway, for the width of the interecting walkway. This permits ramping without cometely eliminating the curb. The ramping, plus the ontinuance of the curbing at the path's edge acts to gnal blind pedestrians that they are approaching a ehicular crossing. Additionally, special rough or texred surfaces may be utilized on and approaching such mps to act as an additional signal for the blind.

A number of alternative solutions are possible; owever, many have undesirable characteristics. For xample: short ramps from the top of a curb to the street vel represent a hazard to all and add to the difficulties street maintenance. In cases where the solution is to rn the street curb along the edge of the walkway for e length of the ramp, great care must be taken to ard pedestrians against the hazard of tripping on or er the ramp's curb. It may be necessary in such instances to erect barriers or establish plantings t will discourage pedestrians from walking anywhere cept on the walkways provided, in these ramped lo tions. Certainly, every precaution should be taken assure that provisions made for the benefit of whe chair users do not become hazards to others.

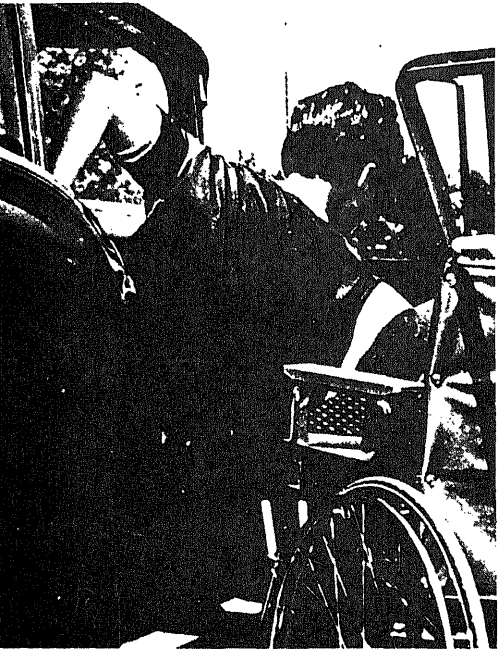
Proper sight distances at intersections are also critical importance to wheelchair users and other sl moving handicapped. The appropriate location of in sections, site furniture, plantings and trees; the n for signal and warning devices; and the adequacy illumination levels, all constitute key considerations the effort to provide free and unobstructed views both pedestrians and the operators of vehicles, and help eliminate safety hazards.

7. GRATINGS/MANHOLES

Any grating, manhole or other surface aberrat constitutes an inconvenience and a safety hazard to handicapped who must use a wheelchair, crutches a cane. The simplest solution is to avoid locating s obstructions in walkways, crosswalks or other circu tion areas used by pedestrians.

Gratings of parallel metal bars are extremely haza ous and must be avoided. Openings in screen-type g ings, manhole and other access covers located wh





there is circulation, should be flush with the surfac
the pavement.

Road drains necessarily require openings la
than 3/4 inch square, to keep from clogging. Where t
is a curb, the capacity of the grating openings ma
enlarged by extending them into the vertical curb
face; however, the best solution is to avoid loca
them in pedestrian circulation areas if at all possi

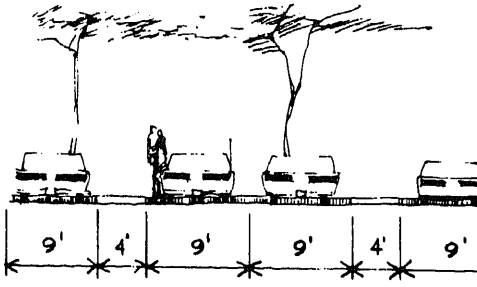
8. PARKING

Special driving and parking privileges are gene
accorded students, staff and faculty with either
porary or permanent handicaps; they are usually allo
to use any campus roads and to park in spaces
convenient to their destinations.

The number and location of parking bays and sp
for the handicapped are generally listed in the site
gram for the campus. Such spaces must be speci
designed to facilitate movement by users of wheelch
and crutches, and they must be properly identified
signs or markings that restrict them to their intended

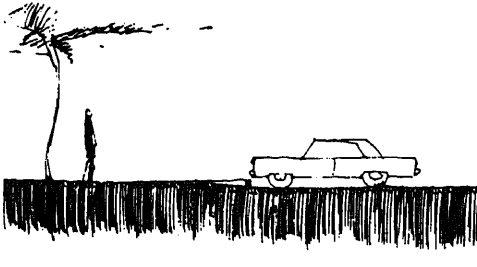
Wherever possible, parking spaces for the ha
capped should be designed parallel to the curb,
located at the edge of the parking area nearest the
sired building or destination point, to provide dir
easy and unobstructed access. It is dangerous for
handicapped to have to go through the parking are
cross traffic lanes in moving to or from their cars.

Where parallel parking is not feasible, bays at least 9 feet wide are necessary to provide adequate room for parking and getting in and out of the car. An aisle 4 feet wide, located between every two spaces, is necessary to facilitate movement and to insure that the handicapped are not required to travel behind parked cars, to enter or leave the parking area. Clear, level or ramped access should be provided between each aisle and the adjacent walkway or roadway leading to the destination sought.



9. BUS SERVICE

Specially designed buses, equipped with a hydraulic lift at the front door and appropriately designed steps and rails at the rear door, are now commercially available. They enable the physically handicapped, including those in wheelchairs, to assume more responsibility for themselves and to get about even large campuses independently and with dignity, on their own initiative. Such buses, running on regular schedules and routes, like other buses, open up broader opportunities in program and a wider variety of extra curricular activities for the handicapped by freeing them from complete dependence upon others. Moreover, the provision of bus service for the handicapped not only alleviates official concern for individual welfare regarding transportation about the campus, it also reduces the problem of the liabilities that might exist were other students or staff expected to be responsible for individuals in wheelchairs.



INTERIOR

GENERAL

Dining Halls. The handicapped should be able to tain food without special services, segregated fa- ities or the necessity of traveling through a high- zard area such as the kitchen or the dishwashing area. the serving line, the serving tray slide can be at the nventional height of 34 inches. The clear area be- een the serving tray slide and the control railing ould be a minimum of 34 inches.

Self-service beverage or water faucets should be of type permitting the glass to rest upon the counter ile being filled.

There should be an appropriate number of rectangular ing tables providing a clear space of 30 inches from floor to the underside of the table top; such tables ould not be equipped with aprons.

Access to tables is provided when there is sufficient aisle space for a wheelchair, between tables in rmal use. This necessitates an aisle of 5 feet 6 inches hough, under some situations, this space could be less.

Laboratories. Several student stations should be signed for the handicapped in wheelchairs: The under- e of the work surface should be a clear 30 inches m the floor; the width of the knee space should be least 28 inches. Wherever possible, aprons should be minated from tables, and service outlets, faucets and tets for gas should be side-mounted, rather than r-mounted.

Lecture Halls and Classrooms. In all lecture halls, space for wheelchairs should be provided in fron the fixed seating in an accessible, level area wi optimum hearing and viewing range.

In classrooms with movable seating, periph space can be provided for the wheelchair of the ha capped student.

- Field Houses/Theaters. Special sections of thea and field houses should be set aside for wheelc users. At the University of Illinois, an extra-wide ci aisle makes it possible to station wheelchairs ou the circulation pattern. Any space provided for wh chairs should be level.

Physically handicapped students will be participa as well as spectators, in theaters and auditoriu Therefore access should be provided to stage and ticipation areas, and part of the dressing room a should be adapted for the use of the handicapped.

- Gymnasium/Physical Education Areas. The Phys education program plays a very important role in the habilitation and well-being of the physically ha capped. Access to facilities should be provided most of them can readily be used by the handicapped, though swimming pools and workout rooms may requ some special adaptation before they become usable. C sideration must be given to the handicapped perso role as a spectator as well as a participant.

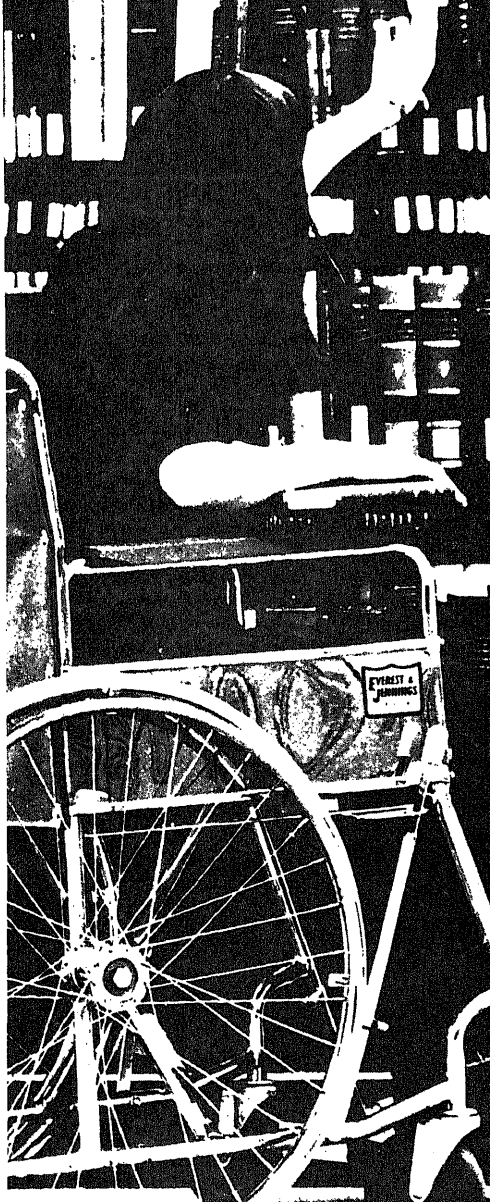
Locker rooms should be so designed that at le part of the area is accessible to a person in a wh chair. Showers and toilets connected with the phys

ducation program should conform with the general per-
ormance criteria for such facilities. (See below, p.23)

• Libraries. It is not economically or functionally easible to design book stacks so that all may be utilized atisfactorily by a wheelchair operator. However, reach-rs, hung at the end of each stack, may prove helpful o the handicapped in reaching books on upper shelves.

The aisle between stacks should be at least 4 feet ide, for wheelchair users. Provision should also be ade for soundproof booths or study carrels, within the ibrary, where the blind may use tape recorders or talking-ook machines -- or student readers, should such be vailable.

• Room Identification. For the blind, each room should e identified by a plaque bearing raised or notched umbers. This plaque should be located on the wall ext to the door, on the handle side, not upon the door, tself, since the blind person trying to feel-read the laque on a door is subjected to a hazard should some-ne open the door from the other side. Also, for the lind, embossed tape, in braille, should be affixed to anic bars on doors which have them, to indicate the lace to which the door leads.



World War I we had 400 paraplegics. One third of them survived nsport back to the United States, and of that third, 90 per cent ed within a year. Only three survived more than eighteen months; e others died of a urinary infection.

at happened in World War II? There were over 2,000 paraplegics. nety per cent of these survived transport back to the United ates. Now, twenty years later, between 1700 and 2,000 are still

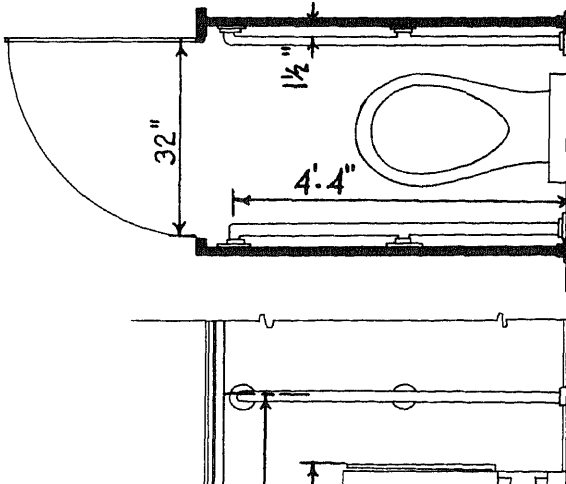
REST ROOMS

Toilet Enclosures. There should be at least one ecially designed closet-type toilet enclosure or stall a men's rest room and one in a women's rest room, each building used by the handicapped, on the floor st easily accessible to them. Preferably, this stall enclosure should be in that area of the rest room thest from the entrance door. In buildings of three more stories, such a special enclosure should be ovided on every other floor and, in one-story buildings tending over large areas, consideration should be ven to having more than one enclosure for each sex. Where possible, in buildings where allowance is be- made for wheelchair users, sufficient space should allowed in the toilet enclosure to permit a lateral nsfer from wheelchair to toilet, on either side. How- er, this is not essential, since the necessary transfer n in most cases also be made from a wheelchair posi- ned obliquely or directly in front of the toilet. About e in three of those unable to place weight upon their t can transfer from the frontal oblique position; some n transfer frontally to use the toilet back to front; ers can remove the chair backrest and slide through the back of the chair onto the toilet.

A larger toilet enclosure is particularly benef in the case of a handicapped individual who ca transfer from wheelchair to toilet without assist from a second person, to whom additional space necessity.

In cases providing only enough space for a fr approach by a wheelchair user, the minimum accept size for the toilet compartment is 3 feet wide by 4 10 inches to 5 feet 6 inches deep. The stall door sh be 32 inches wide and should swing out.

● Toilets. The toilet should be centered in the rea the enclosure; a toilet set to one side may not be us by a hemiplegic. The toilet seat should be 19 in from the floor. A wall-mounted toilet is preferred ov floor-mounted toilet, for wheelchair users, beca leaving room for footrests, it permits a close fr approach by the wheelchair. Such toilets also facili floor cleaning. If it is necessary to use a floor-mou toilet, its exterior front surface should recede qui to the pedestal, so that a close frontal approac possible, before the footrest of the chair strikes toilet pedestal.



ails. Each toilet enclosure for the handicapped
e equipped with horizontal grab rails, one on
l. These rails should be 33 inches from the
ould extend at least 4 feet 4 inches, front to
ould be 1-1/2 inches in diameter; and should
wall by 1-1/2 inches.

lagonal rail, satisfactory primarily to ambulant
ped, rather than wheelchair users, may also be
hough it has some disadvantages. It is un-
ory for a person with a poor grip (arthritic
etc.); it is unworkable for the handless person
support himself on a horizontal rail; and its
slope, of advantage in one direction, proves
ageous in the other.

s. Since the majority of wheelchair users pre-
ivacy of the toilet enclosure, provision need not
for the use of urinals by them. Semi-ambulant
ls will, however, use urinals. Wall urinals are
to the stall urinals. The front rim of the urinal
uld not be more than 19 inches from the floor.

tory Bathrooms. It is most desirable that
bathrooms for the handicapped be private or
ate and directly accessible from the bedroom

nts with bowel and bladder complications re-
e bathroom facilities and occupy these facil-
onger periods. In planning dormitories specific-
use by handicapped students, a larger toilet
dvantageous. Grab rails in this case would be
on a base attached to the floor and would swing out.

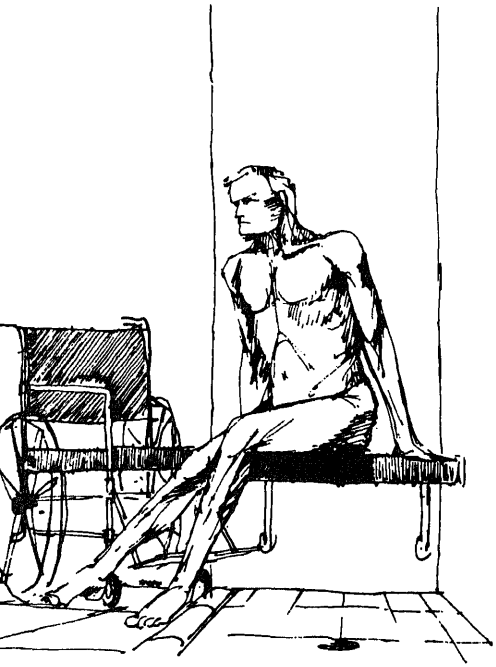
- Lavatories. To avoid interference with wheelchair maneuvering, lavatories should be wall mounted on brackets or contained in a counter top. There should be a minimum clear space of 26 inches below the sink, and the sink or counter apron should be shallow. Since many wheelchair users may have limited or no feeling in the legs, hazardous contact with hot water lines or drain piping under the sink should be guarded against by mechanical separation or by insulation.

  Lavatories for the handicapped should not be equipped with self-closing faucets; faucet handles must be easy to manipulate and should clear the adjacent wall surface by 1-1/2 inches. The hot water faucet should always be placed on the left and the cold water faucet on the right of the user of the sink, to permit reliable, automatic location by the blind.

- Mirrors. Normally, the top of a fixed mirror will not be less than 6 feet 6 inches above floor level. However, for wheelchair users, the bottom edge of a mirror should not be more than 3 feet above the floor. Where space allows, a full-length mirror starting 2 feet from the floor is useful.

  In dormitory bathrooms, a duplex electrical outlet should be located no more than 4 feet from the floor, adjacent to the mirror.

- Showers. Every shower room used by the physically handicapped should contain at least two specially designed shower cubicles, one with a seat positioned on



the left cubicle wall, the other with the seat on
right. Seats should be hinged so that they can be fol
back against the wall when not in use; they should
positioned on the side wall to facilitate transfer f
the wheelchair; and they should be at approximately
same height from the floor as the wheelchair seat
inches).

The shower cubicle should be 3 feet wide by 3 f
deep, with a suitably drained, non-slip floor surface. T
curb at the threshold of the cubicle should be no m
than 2 inches high, which is high enough to confine s
face waterflow and most splash, but low enough to al
wheelchair footrests to pass over, bringing the ch
seat closer to the seat within the cubicle, for safer a
easier transfer.

A horizontal rail or grab bar attached to the cubi
wall opposite the seat, and extending around on the be
wall is desirable for wheelchair users. Wrist-type hand
should be used for water control, aided by a water th
mostat to prevent scalding. A diversionary shower sp
consisting of a flexible hose to which is attached
shower head may be provided to permit the testing
actual water temperature before entering the cubic
The soap tray should be set 3 feet 6 inches from t
floor.

3. BEDROOMS

Rooms should be designed and furniture designed a
located for the benefit of the wheelchair user, wh
would also provide a convenient environment for t
ambulatory handicapped.

The bed is a key element in the plan. The minimum istance between a dresser or desk and the side of a ed should be at least 4 feet 3 inches; the distance be- ween the foot of a bed and any wall surface should be t least 4 feet; and the distance between the side of a ed and any wall surface should be at least 3 feet 2 nches.

Indirect lighting above the head of the bed is re- ommended; ceiling lights are not. A reading light in- orporated into the indirect lighting unit at the head of he bed makes a practical arrangement.

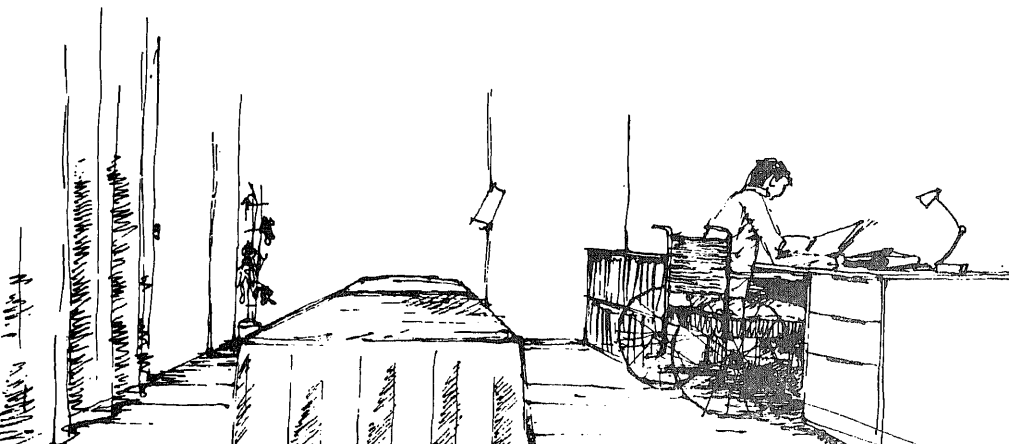
Closets and wardrobes should be designed to permit he partial entrance of a wheelchair. Doors should slide, ith the riding rail either at the top, or sunk beneath he surface of the floor. The door width may be less than hat normally required for a wheelchair, because only artial entrance is required. The hanging bar may either e specially adjusted to fit the needs of the student, or trapeze bar may be utilized to lower the height of the loset bar to meet the student's individual needs.

Dormitory Bedroom Furniture. Although furniture pecifically designed for use by the handicapped should emonstrate certain unique design characteristics, it hould also be so designed as to be usable, without alteration, by students who have no handicaps.

The bed should provide cupboard or drawer-ty storage space beneath that is easily accessible to person lying in bed. Drawers or doors should not self-closing or spring closed. Easily accessible spa should be provided for storage of a bed pan. The boa or slats supporting the springs and mattress should treated with waterproof sealant and all assembly ha ware should be rust proof.

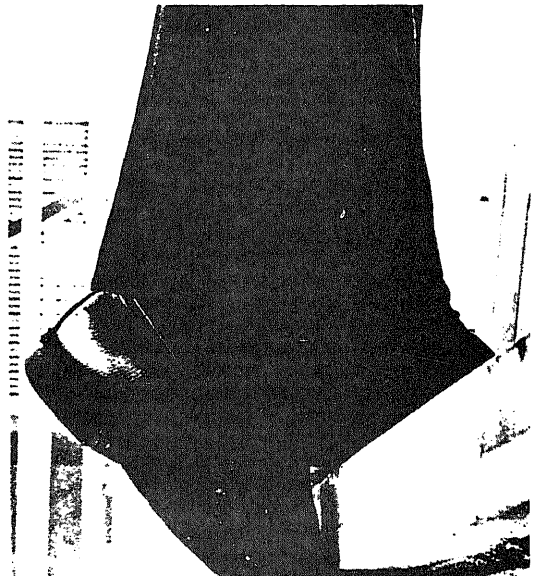
The mattress top should be at least 22 inches abo the floor. The mattress should be a medium firm or fi double-core foam mattress 5-1/2 inches thick. This ty of mattress lets air circulate more readily around t pressure points of the body.

The student desk should provide knee-hole space least 28 inches wide, which permits a wheelchair to moved up close to the desk. The under side of the de top should be at least 30 inches above the floor; apro are to be avoided on all desks and tables for wheelch users. The desk telephone should be so positioned as be readily accessible from the bed. Special telepho equipment is available to help the hard-of-hearing c duct a normal telephone conversation.



4. STAIRS

- Illumination. All stairways should be well illuminated by means of windows and/or artificial light. A landing midway between floor levels serves as a safe stopping place for invalids subject to dizziness or breathlessness, and for cardiacs and others who must conserve energy. For the benefit of those with partial sight disabilities, landings should be distinguished from stairs by contrasts in color or surface texture where they meet.
- Risers. Staircases with open risers are to be avoided as hazardous to elderly people and to those subject to dizziness. Risers should be no more than 7 inches in height; 6 inches is much preferred, in facilitating use by the ambulant handicapped. Any projecting nosing is to be avoided as posing difficulty for individuals with leg restrictions (artificial leg, leg brace). A splayed riser with a non-projecting chamfered nosing is recommended.
- Handrails. The vertical distance from the riser nosing to the top of the handrail should be 32 inches. Handrails must be securely fixed and easy to grip. They should continue at least 18 inches on the level beyond the stairs, at both top and bottom. Because many handicapped people cannot negotiate stairs or landings without the



elp of handrails, these should not be discontinued at alf landings or where windows occur.

Preferably, handrails should be provided on both ides of the stairs, for the benefit of all users. Where rail is provided on one side only, hemiplegics or others ith weakness on one side of the body may be able to egotiate the staircase or ramp in only one direction.

A handrail with a circular or oval section 1-3/4 to 2 nches in diameter is most satisfactory. Arthritics and thers with hand weakness or disability find it difficult grip properly rails with sharp edges or with dimensions reater than 2 inches deep or 2-1/4 inches wide. Studs, xed at proper locations on the inner surface of hand-ils, help the blind become aware of the presence of ndings or the end of the stairs.

ELEVATORS

In planning for vertical circulation in multi-story ildings, today, the inclusion of elevator service is a asonable design assumption quite apart from any con-deration of the needs of the handicapped. For the ndicapped, however, elevator service is a must. In rmitories to be used by the handicapped, where there e no rooms for students on the ground or entrance oor, and in multi-level academic and service buildings, ere should be at least one elevator accessible to and able by the handicapped. This should serve the level ed by them for entrance into the building and all other vels normally used by students and faculty.

Elevators should, wherever possible, operate auto-tically; they must stop precisely at the floor level, d must be automatically self-levelling. Elevator doors at open and close automatically must be fitted with a sensitive safety edge and should be controlled as w by photoelectric cells that cause the doors to s closing and return to the open position whenever clos is in any way obstructed. On opening, doors should timed to remain open at least 8 seconds; their clos speed should be slow, requiring from 3 to 3-1/2 secon A slow closing speed not only benefits the handicapp but also helps when the elevator is being used for moving of supplies, furniture and equipment.

The interior of the elevator cab should be at l 61 inches deep by 66 inches wide, to permit a wh chair to turn around inside. At the entrance floor, wl traffic is heaviest, an unobstructed, level area at l 5 feet by 5 feet should be provided in front of the vator door.

To make specific allowance for wheelchair us elevator controls must be at a height that is access to a seated person and must be easy to operate. emergency call button or switch must be included an the controls. Controls located in the side walls, ra than on a panel beside the door, are more conven for wheelchair users and work no disadvantage to otl using the elevator. Horizontal grip rails fixed to walls about 3 feet from the floor are also helpful to handicapped. Interior surfaces should be tough enc to resist marring by wheelchairs.

- Wheelchair Lifts. The problem of providing vert transportation for wheelchair users in a multi-s building otherwise without elevators, may satisfacto be solved by means of a wheelchair lift attached to exterior of the building. Such equipment is operated key given only to handicapped students and facu

ce is always a physical hazard to be considered, whether the

DOORS

Doors are important to all handicapped, but they are rticularly important to those in wheelchairs and on itches. Their needs, therefore, have been considered ramount in the development of performance criteria on ors.

Both side-hung and sliding doors are usable by these ysically handicapped, if properly located and provided th proper hardware. Side-hung doors create a problem en they are located in awkward or inaccessible posi- ns. Conventional sliding doors with recessed handles sent a problem, since even able-bodied people some- es have difficulty gripping handles of that type

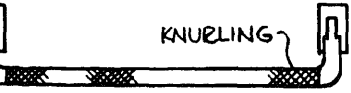
All doors to be used by the handicapped should pro- le a minimum clear opening of 32 inches. This will e care of a wheelchair approaching at a 90-degree gle. If the location of the door or obstructions to tering it make an oblique approach necessary, the ar opening will have to be larger than 32 inches. structions further than 4 feet 2 inches from the door ening will not prevent the wheelchair user from making direct, right angle approach. All door widths cited in se criteria represent clear openings, not the overall dth of the door, itself.

Doorway approaches should be level for a distance at least 5 feet; the level area should extend at least oot on each side of the doorway. Whenever possible, doors opening into corridors should be recessed ficiently to avoid the hazard of accidents.

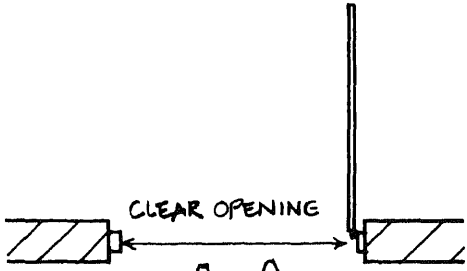
- Side-Hung Doors. The clear opening width provi by side-hung doors is generally about 2 inches than the width of the door itself. This disadvan can be partly overcome by the use of swing-clear hos hinges. A side-hung door located in a corner posi should be so hinged as to swing toward the wall sur that creates the corner. Where a wheelchair user pull upon the handle of a side-hung door, in orde open it, any obstruction along the wall adjacent to handle will cause problems. Consequently, an unobstr ed area at least 15 inches wide should be planned to the handle side of the door; a larger area is prefer

When a door is located on the side wall at the en a passageway, the handle should be positioned away the corner. If this is not possible, the door frame be at least 6 inches from the wall surface at the en the corridor.

The pressure required to open a door should exceed 8 pounds; the preferable maximum is 5 pou If automatic door closers are used, they should pro an adequate time delay (about 4 to 6 seconds) be closing. A longer interval is preferable for wheelc users and the ambulant handicapped, but condition specific rooms (e.g., an air conditioned laborat may necessitate a shorter delay.

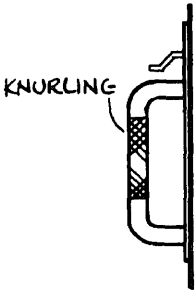


PANIC BAR





NOB



HANDLE and LATCH

Sliding Doors. The single-leaf straight sliding door the most easily operated. If there is not sufficient wall recessed space for a single-leaf door, bi-parting ors that operate sympathetically on a single track are equate. Protruding handles on bi-parting sliding doors more useful to the handicapped, but they cut down width of the opening by preventing the doors from ng fully recessed. Also, when such handles protrude m both faces of each door, they must be at least 3 hes apart when the doors are closed.

Swinging Doors. If possible, double action swinging ors, either single or double leaf are to be avoided. ey are hazardous for wheelchair users, for semi- bulants using braces, artificial limbs and/or crutches d canes, and for the blind. Where their use cannot be oided, proper glazing helps avoid accidents. For eelchair users, visibility is provided if the glaz- starts no more than 3 feet from the floor; an effective ernative solution is a strip of safety glass, 6 to 8 hes wide, commencing just above the kickplate and tending up the door toward the free-swinging edge, to oint slightly above eye height for a standing person. In existing buildings, where a side-hung door can y be located awkwardly for wheelchair users, a uble-action swinging door may be substituted as the y acceptable solution in this situation.

- Revolving Doors. Wheelchair users, users of crutc and canes, and the blind cannot satisfactorily use volving doors. Where they are installed, an additio side-hung door should be provided.
- Thresholds. Raised thresholds should be avoide at all possible. Where they are unavoidable, their hei and shape must be dictated by the needs of the ha capped. Wheelchair users cannot negotiate a thresh higher than 3/4 of an inch, and any threshold should gradually beveled to its full height, front and rear, avoid any abruptness or bluntness that would consti an obstacle to a wheelchair user. Sliding-door guide rails that project above the floor surface across the w of the door opening are also to be avoided.
- Hardware. Door handles should be positioned not m than 3 feet 6 inches above floor level. Horizontal le handles are preferable, although large, serrated d knobs are also recommended. Door handles that are s pery or difficult to grip may be modified to a roug texture by coating with a special adhesive. Widespr use of such treatment may be disadvantageous, howe in the case of the blind, for whom the use of such an hesive serves primarily to signal the existence o hazard area.
- Kickplates. Doors in areas serving the handicapp particularly wheelchair users, may advantageously

quipped with kickplates, preferably 16 inches high. A ickplate of this size helps prevent marring and damage o doors from wheelchair footrests and hand rims, crutch-s, canes and prosthetic devices, and is an aid to main-enance.

. CONVENIENCES

Accessibility to the wheelchair user remains the re-eminent design consideration in the location and esign of items of equipment that must serve efficiently e handicapped and non-handicapped alike.

Light Switches. No more than 2 switches should be cated on a single plate, at a point between 3 and 3-1/2 et above the floor. The action of switches should be mple and positive; a pushpad clipped over a rocker-ction switch permits easy operation by forearm or elbow; large push button may also be convenient for those th finger or hand disabilities.

Outlets. Normally electric outlets are placed 18 ches above the floor. In an area planned specifically r use by the handicapped, outlets should be located least 24 inches above the floor.

Drinking Fountains. Each floor of any building used the handicapped should be equipped with a drinking untain that is usable by a wheelchair operator. The per edge of the fountain basin should be located 3 et from the floor. If it is necessary for the fountain to





be set back out of the way of traffic, the recessed a should be at least 2-1/2 feet, and preferably 3 feet w

Controls and spouts should be up front and oper by hand alone; spouts should not point obliquely to rear, but should parallel the front surface as closel possible.

Where special fountain arrangements cannot be m a paper cup dispenser should be provided; however, causes maintenance problems.

- Public Telephones. Wherever public telephones provided they should be wall mounted, without leg enclosure prohibiting access. The dial should be p button, if possible, and located no more than 4 feet the floor. A volume control should be incorporated w ever possible. The underside of any shelf that is p tioned under the phone should clear the floor by at l 30 inches.
- Vending Machines. The reach height of a perso a wheelchair should be one of the criteria governing selection of vending machines. Also, pull knobs or trols should provide a good grip and operate eas

8. FIRE PROTECTION

Time is the essential factor to be considered in steps taken to assure life safety from fire. Every te nique used and every building element considered be evaluated for its contribution to life safety in te of its effect on time in one of two ways:

Will it increase the critical time before intolerable conditions are reached?

Will it decrease the reaction time required for an occupant to achieve life safety?

As long as the reaction time (to achieve life safety) less than critical time (to reach intolerable conditions), life safety may be assured. Any valid system r assuring life safety will, therefore, be based on the inciple of "buying time," by decreasing reaction time d increasing critical time. Reaction time may be deeased by providing automatic detection units sensitive ough to detect the products of combustion early, and ve the alarm. Critical time may be increased through e use of fire-inhibiting devices, such as fire doors d walls, and devices to control or extinguish fire, ch as automatic sprinklers.

The question as to what may happen to the handipped, in a fire, is moral as well as technical. Eletors have made high-rise or multi-level facilities cessible to the handicapped. Since elevators are ither a legal nor a safe means of egress, in a fire, the ndicapped person, particularly a wheelchair user, is able to exit unassisted.

Area of Refuge. One solution would be to provide, thin the area accessible to the handicapped, an area refuge on each floor. This area of refuge could be ther on the side of a fire wall that is away from the potential fire source, or in an area within the enclos of a fire stair. It should be located out of the wa main traffic circulation, particularly in a stairwell; ed benefit would be achieved if this space were equip with a break-glass alarm device to signal, by bel light at the base of the stairwell or elsewhere in the alarm system, the presence of a handicapped perso the area of refuge.

- Fire Extinguishers and Alarm Boxes. Fire ex guishers should be located on walls at a height acce ible to the wheelchair user. If the extinguisher is closed in a wall recess with a glass door, the har of the door should be easily operable and the top of extinguisher should be about 4 feet from the floor.

The fire alarm box should have a pull-type han easily grasped. Where possible, for the sake of deaf, the alarm system should provide visible, as as audible signals.

- Automatic Door Closers--Fire Doors. Where a matic door closers are adjusted for the sake of wh chair and crutch users, there is danger that a fire d so adjusted, may not remain effectively closed strong draft. Fire doors, under such conditions, advantageously be equipped with electro-magnetic sm and-heat-sensitive door holders, which would hold fire door open during normal use and would clos during a fire.

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The following contributed their opinions and thoughts
her in interviews or by letter. While this report at-
npts a consensus, opinions varied, and, therefore,
tements in the text should not be attributed to any of
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STATE UNIVERSITY CONSTRUCTION FUND

PUBLICATIONS

OVERALL PROGRAM

Campus plans for State University of New York

Annual Report

Project Monographs

PLANNING PROCESS

Guide for Campus Planning ($5.00)

Development of Site Programs and Budgets ($2.75)

PERFORMANCE CRITERIA

Site Products ($7.25)

Making Facilities Accessible to the Physically Handicapped

ARCHITECTURAL CHECKLIST

Making Colleges and Universities Accessible to Handicapped Students

Facilities, particularly those for education, should be constructed or modified to facilitate access for all. Physically handicapped people have been subjected to unnecessary impediments in the design environment. Such impediments interfere with use by those who most require educational opportunities to become self-sustaining.

Where there is additional cost attributable to designing and planning for the physically handicapped on campuses, it is small and more than offset by the fulfillment of personal potential and contribution to society by persons who, although handicapped, become skillful, productive members of their community.

This Checklist is a guide for use during the planning, design, and construction phases of campus projects. It can be used also to evaluate the accessibility and usability of existing facilities on a campus.

Information contained in this Checklist was compiled by the State University Construction Fund, 194 Washington Avenue, Albany, New York 12210.

These data are reprinted here by the President's Committee on Employment of the Handicapped in the hope that colleges and universities around the country will find the Checklist helpful in making all educational facilities accessible to handicapped students.

DOORS

and inner) must be a minimum of 6 feet 6 inches so that a wheelchair cannot be trapped between the two.

All doors require a minimum clear opening, 2 feet 8 inches. Maximum pressure to open a door should be not over 8 pounds.

Thresholds: Shape for accessibility, height should not exceed 3/4 inch.

Handles: Should be 3 feet 6 inches from floors. Horizontal lever handles are preferable. Handles should be knurled to serve the blind as indicators of danger areas. On sliding doors, handles should protrude.

View Panels Glazing should be in all swinging doors. Lower edges should be no more than 3 feet from floors. Doors with large areas of glass should have markings on the glass to avoid accidents.

STAIRWAYS

Stairways are to be well illuminated at all times.

exterior

The riser should be a maximum of 5-3/4 inches high. The tread should be a minimum of 14 inches wide.

All stair treads and nosings are to be surfaced with a nonskid finish.

Handrails, 32 inches high, should be located on both sides of stairs and should extend 30 inches horizontally at both top and bottom levels. (Care should be taken to design handrail extensions so that they do not become hazards.)

interior

The landings and floor levels should be distinguished from stairs by contrasting color or texture.

The risers should be no more than 7 inches high with no projecting nosings.

All **handrails** (circular or oval section; 1-3/4 inches– 2 inches in diameter) should be 32 inches high (measured vertically from stair nosing) and continue 18 inches horizontally at both top and bottom levels.

Five percent of the of bays should reserved for disabled persons.

The width of a bay should be minimum of 9 feet. Pedestrian acc between every other bay reserved the disabled should be 4 feet.

A ramp should be provided if there level change from the parking lot to adjoining walk.

The area for the disabled should designed so that movement beh parked cars or across lanes of traffi not necessary.

ELEVATORS

All elevators should be adjusted/controlled that the floor the elevators, when stopped, conform exactly to building fl levels.

The cab size should be a minimum 5 feet 1 inch deep by 5 feet 6 inc wide.

The **doors** should have a sensi safety edge plus a sensing device, (photo electric eye) to prevent clos while entering or exiting.

No **control** should be higher thar feet from the elevator floor.

WALKWAYS

There should be at least one acc without steps connecting all facili on a campus.

Pavement materials used on walkw should be firm and not slippery wh wet.

Walks with 5 percent gradients m have frequent level rest areas (i.e. feet maximum intervals).

Intersections of walks with stre must be blended by ramps.

Gratings, manholes and li impediments should not be located walks.

Pedestrian paths of travel – These are defined by their gradients as follo

0% – 3% are considered walks, (surface of adjacent ground at same l as walk).

3+% – 5% are considered walks, but frequent rest areas are necess (surface of adjacent ground at same level as walk).

5+% – 8% are ramps and require curbs and handrails, on both sides.

8+% – 10% (Absolute maximum) curbs and handrails are required on b sides, distance between curbs must be 30 inches. Level

intermediate rest platforms a minimum of 4 feet 6 inches every 30 feet of ramp.

The approach to a ramp should be level, and a minimum of 6 feet in length.

Where a ramp enters a building, there should be a platform of 5 feet minimum depth from the building extending a minimum of 1 foot on each side of the doorway .

If there is a significant drop from the side of a ramp or platform there should be handrails on both sides 32 inches above the ramp surface, the full length of ramp.

Ramps exposed to the elements either should be protected by a canopy or provided with automatic snow-melting capacity.

spaces requiring special attention

hysically disabled occupants should be assigned bedrooms on the ground loor or floors directly accessible to grade. Other floors should be accessible o that a disabled student can visit friends on any floor.

OORMITORIES

A minimum of 2% of dormitory spaces on a campus should be able to accommodate the ambulatorily handicapped.

Room plans should permit furniture placement so that there is no less than 4 feet 3 inches between major elements. (Between the side of the bed and a wall surface there may be 3 feet 2 inches.)

The **mattress** top should be about 22 inches above the floor level.

There must be a **telephone** and it must be readily accessible from the bed.

The **clothing storage** facility should be such that a person in a wheelchair can store and retrieve effects independently, (e.g. hanging rods should be at suitable or adjustable heights for wheelchair occupants). Partial entrance of wheelchairs should be possible.

Windows should be easily operable by a

FACILITIES

physically handicapped. It should b located most distant from the spac entrance.

toilet/stalls

The **stall door** to the toilet accessib to the handicapped should have 2 fe 8 inches opening clearance and shoul swing out.

A stall should be 3 feet wide 4 feet 1 inches to 5 feet 6 inches deep.

The toilet, preferably wall mounte should have a seat 19 inches above th floor.

Grab bars, 1 1/2 inches in diamet and 1 1/2 inches from walls, are to b placed on both walls, 33 inches abo the floor.

sinks

Clear space below a sink for th handicapped should be a minimum 26 inches above floor level.

All **faucet handles** should be easy operate (e.g. lever handles).

Hot water lines and drain, under sin should be shielded to protect the le of a person in a wheelchair.

mirrors

Mirrors should be placed so that th bottom edge is not more than 3 fe above the floor level.

showers

The following applies to all show rooms with two or more stalls.

Two of the stalls should be accessib to the handicapped and shou measure 3 feet x 3 feet.

The floor surface should be nonsl and the curb should be no more than inches above floor level.

A **seat** should be positioned 19 inch above the floor. In one stall the se should be positioned on the leftha wall and in the other it should b positioned on the righthand wall. Th seats should be hinged to fold again the wall and a grab rail attached to th stall wall opposite the seat shou extend around on the back wall.

The **water control,** diversionar **shower spray,** and **soap tray** all shou be placed 3 feet, 6 inches above th floor.

*(In re Dormitory suites designed for the handicapped with only one showe stall: each should be equipped as above. Alternate left and right han

There must be thirty inches to the undersurface of table tops, if aprons are greater than 2 inches they must be [illegible] one foot.

Width between tables should be a [illegible] of 5 feet 6 inches.

[illegible] rail heights of tray slides may be no greater than 34 inches.

Aisles between the tray slides and control railings should be a minimum of 34 inches.

LECTURE HALLS

(Where space is level and has movable seats, handicapped do not require special consideration.)

One percent of the student stations should be for the handicapped.

If there is fixed seating, level space must be provided in optimum viewing areas.

LABORATORIES

In laboratories with 24 or more stations one percent, or at least one, should be dedicated to the handicapped. In other laboratories number(s) of "handicapped stations" should be determined at the time the program is finalized.

Each "handicapped station" should have a low work bench with a clear minimum of 30 inches, (floor to underside of work area) and should not have an apron.

If there are fixed stations, aisles between them should have a minimum clear width of 3 feet.

SPECTATOR SPACES

One percent of spectator stations should be dedicated and specially treated for ambulatorily handicapped.

Areas dedicated to the handicapped should be easily accessible to exits.

All spaces for wheelchairs should be level.

LIBRARIES

One percent of **study carrels** shoul be accessible to wheelchairs (see doc and table criteria).

Aisles between stacks should be minimum width of 4 feet.

All **tables** should have a clea minimum of 30 inches, floor t underside of work area.

specialties

DRINKING FOUNTAINS

Upper edges of drinking fountai basins should not be more than thre feet above floor level. Controls an spouts should be located in the fron (If set in recessed area, their rece should be no less than 3 feet wide.)

LIGHT SWITCHES

No more than 2 light switches shou be located on a plate positioned 3 t 3-1/2 feet above floor level.

ELECTRIC OUTLETS

Outlets must be located no less tha 18 inches above floor. (In area specifically designed for th handicapped, outlet height should b 24 inches.)

ROOM IDENTIFICATION

A plaque bearing raised or notche numbers should be placed on th corridor wall next to a **doorway,** abou five feet above floor level (side neares handle when door is closed), t identify spaces. This will assist visuall handicapped persons.

TELEPHONES

In any "bank," at least one publ telephone should be accessible to handicapped person (e. g. outside of booth). Dial should be between 3 an 4 feet above floor level.

VENDING MACHINES

Vending Machines' controls and acces for them should be located in th range 2 to 4 feet above the floor. Pul on control knobs should not requir more than 8 pounds of tension.

NOTES AND DEFINITIONS

Where any of the above requirements are impossible to meet or are unreasonable because of peculiar program or campus determinants, deviation may be accomplished only with explict Fund permission. Repetition has been minimized (e.g. door requirements have not been repeated).

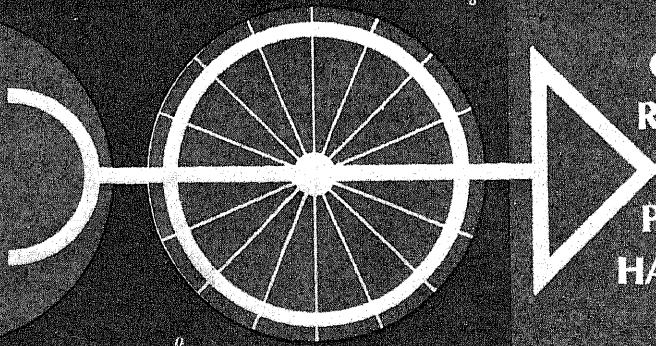
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OUTDOOR RECREATION FOR THE PHYSICALLY HANDICAPPED

OUTDOOR RECREATION FOR THE PHYSICALLY HANDICAPPED

A HANDBOOK OF DESIGN STAND

POLICY STATEMENT

The State Council of Parks and Outdoor Rec
has approved and adopted the standards co
in this report. It calls for the adaptation of all
parks in line with these recommendations



Public services provided by State Government are designed to benefit all its citizens. Consistent with this philosophy the State is now undertaking a program to establish design standards and encourage careful planning in order to make its unrivaled public outdoor recreation facilities more readily usable by its physically handicapped citizens.

Relatively minor modifications of park design will improve access greatly for the many physically handicapped persons who have sufficiently overcome their physical limitations to take part in recreation with family and friends in public parks. The pleasure and confidence to be gained from outdoor recreation are an important part of a full and productive life, and New York State intends to continue leading the nation in providing such opportunities for all of its citizens.

NELSON A. ROCKEFELLER
Governor

INTRODUCTION

The current philosophy of public recreation recog
nizes the responsibility to plan so that *all* citizens
including those with physical limitations, have th
opportunity to use some kinds of publicly provided
recreation. Today, we recognize that to deny the righ
to public recreation to any segment of the commu
nity is to prevent participation in a central part o
American life. Yet the design of our public recreation
areas has not always taken into account persons with
limitations due to physical disabilities and to some
extent has limited public park use by the disabled.

Today, thanks to modern medical treatments and
prosthetic appliances, ingenious self-help devices
and expanded means of rehabilitation therapy, a
growing number of people with physical limitations
are able to live productive and meaningful lives.
When a disabled person has worked hard to gain
sufficient mobility and confidence to attempt recrea
tion in a public park, it is important that his experi
ence be a successful one.

It is intended by these recommendations to de
velop the recreation potential of people who must
depend upon wheelchairs or walkers, braces, crutches,
canes or artificial limbs, or whose coordination,
strength and stamina are impaired through injury,
disease, birth defects or aging. It is not within the
scope of this handbook, however, to make recom
mendations that would enable all disabled park visi
tors to use all park facilities.

The proposals made here will offer people with
physical limitations the same opportunities to use
public park facilities as others. Since the disabled
population is only a small minority of park users it is
not recommended or implied that elaborate, exten
sive new construction or alterations be made for their
use; however, careful consideration should be given
to the problem and the designer or administrator
should be guided by local needs for these specialized
facilities and select the appropriate type and number
required accordingly.

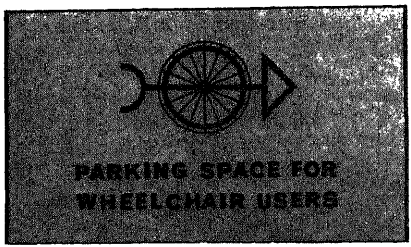
The recommendations made in this handbook are
not exhaustive and it is hoped that they will induce
park designers and administrators, through thoughtful
design and management, to provide facilities which
will greatly increase the recreational potential of any

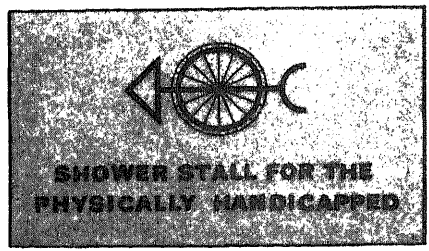
INFORMATION

It is of the utmost importance that the visitor with physical limitations be made aware of the special facilities provided for his use at the point where he enters the park.

Eye-catching signs located at the park entrances plus literature distributed at the entrance control station informing the disabled person of the location and scope of these facilities are needed.

The use of a uniform system of signs bearing a special symbol designating the direction to or location of areas designed for use by the handicapped should be adopted by all parks.





TYPICAL SIGNS USING SYMBOL

ACCESS

Access to all park facilities adapted for use by the physically handicapped is a major consideration in park planning and should be designed to give the handicapped person a maximum of mobility with a minimum of assistance and effort. Unobstructed movement from parking areas to recreation areas and easy entry into comfort stations and other structures is the essential element in providing recreation for physically handicapped persons in public parks.

PARKING

Parking areas should be located as closely as possible to areas or facilities likely to be visited by handicapped persons. All parking lots of any size should have specially designed and designated stalls for wheelchair users. These stalls should be constructed so that a wheelchair may be maneuvered next to a car for easy exit or entrance by the handicapped person. One stall plus .5% of the total parking spaces should be ample.

The parking lot surface should be paved with a smooth, nonslip surface in the area of these stalls. Drop curbs or ramps should be provided for easy access to trails or walks. An opening of 30" should be maintained between guard rails or car stops to allow a wheelchair to pass.

LOADING POINTS

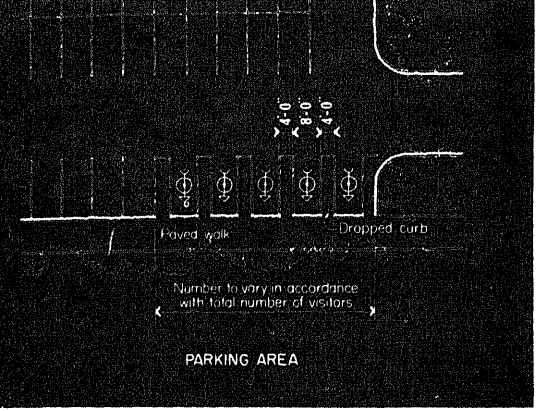
Shaded or covered benches should be located at or cess directly to recreation facilities. Where possible these should be turnouts to avoid blocking traffic and they should be designated especially for use by the handicapped visitor only.

WALKS AND TRAILS

Walks and trails designed for use by disabled persons should have a minimum width of 48" and be paved with a smooth hard, nonslip surface of concrete, sealed asphalt or like material. Care should be taken to minimize expansion joints and expansion joint filler which expands above the walk surface. The walk should be reasonably level in cross section as crowned or banked surfaces make wheelchair handling difficult.

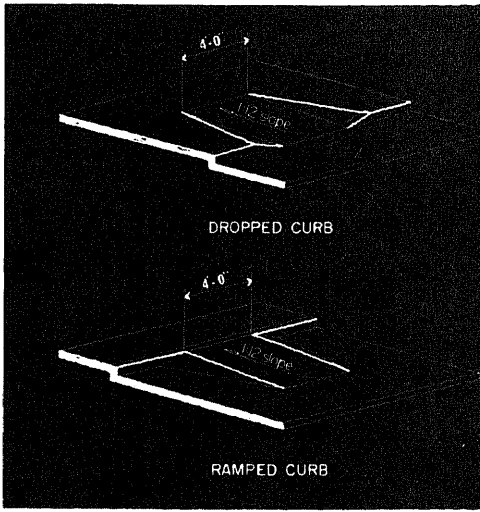
Walks which cross other walks, drives or parking areas should blend to the same level, eliminating steps or sharp breaks in grade. Changes in elevation should be made by the use of ramps.

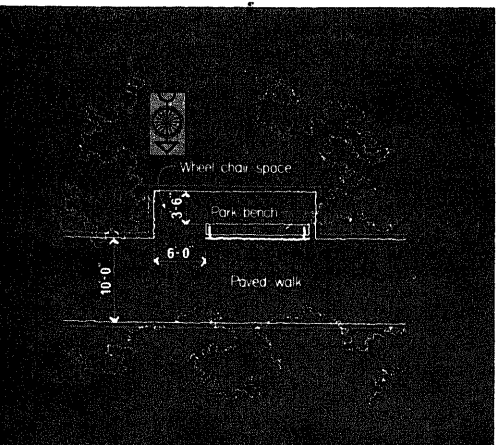
Level spots for stopping, turning and recessed resting areas should be located at convenient intervals. Park benches with backs and arm rests spaced 24" apart along the bench should be provided for assisting a weak or elderly person to raise or lower himself with a minimum of effort. A parking spot for a wheelchair should be provided at one end of such a special bench. Surfacing of the area around the bench should match that of the adjacent walk.

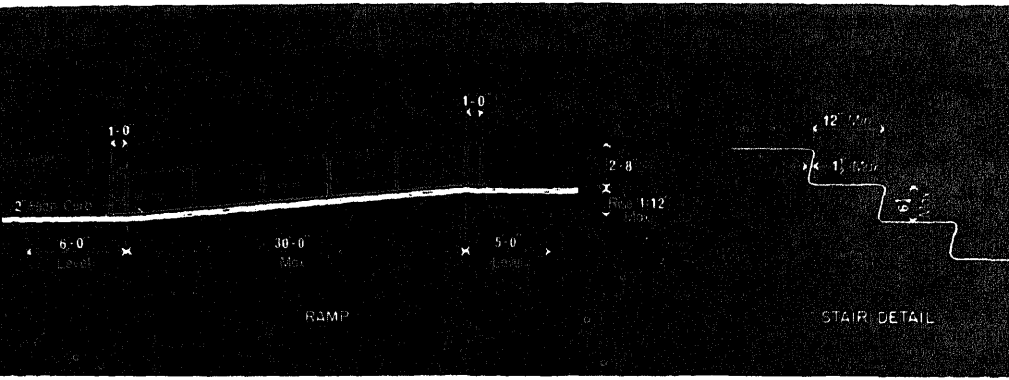


PARKING STALLS SHOULD BE SPECIALLY DESIGNATED FOR WHEELCHAIR USERS ONLY

WHEELCHAIR CIRCULATION BEHIND CARS SHOULD BE AVOIDED.





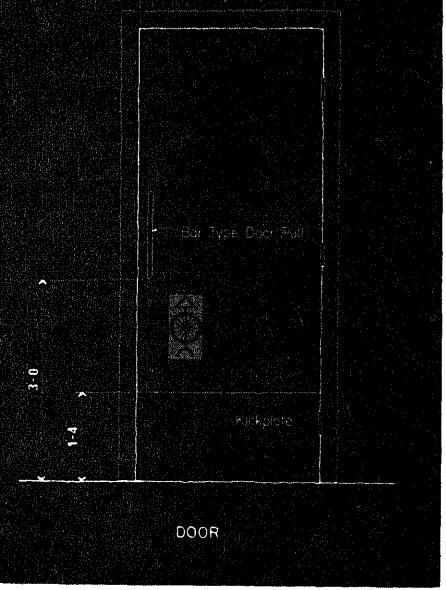


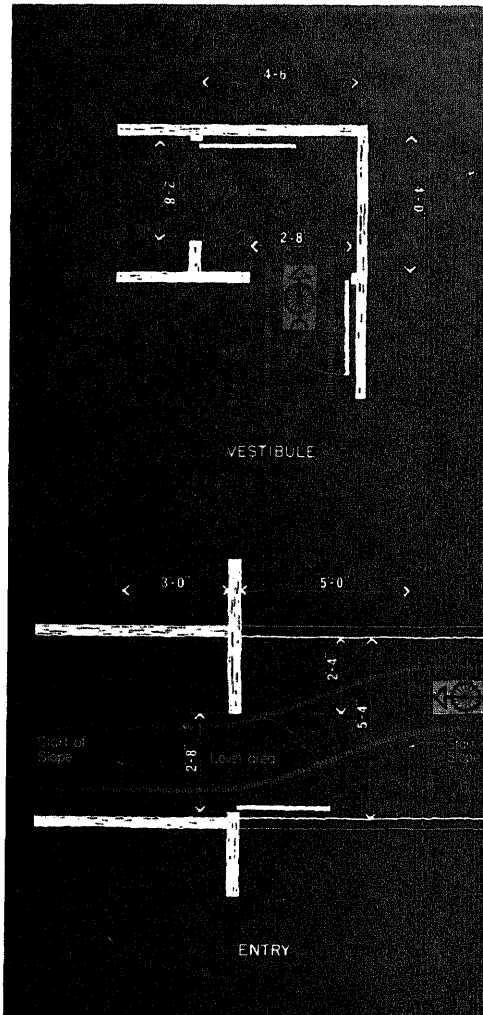
RECOMMENDED FOR USERS
CRUTCHES OR BRACES

RAMPS

Ramps should be used on trails and walks where required by the topographical situation, or to provide access to above-grade structures or facilities for wheelchair users or people with impaired strength and coordination. Ramps should be constructed with a 37" minimum between railings or 72" between railings for two-way circulation. The maximum gradient should be 8.33% or 1:12 (a preferred grade is 5%) with a smooth transition to upper and lower levels. Level platforms on ramps should be provided at top and bottom levels, no less than 30'-0" apart on long ramps and at all changes in direction. Handrails, preferably on both sides, should be 32" high, offset 2" from a wall and extending at least 1'-0" beyond the top and bottom of the ramp. Curbs 2" high and 4" wide of wood or concrete should be under the handrails at ramp level to prevent wheelchairs from rubbing walls or catching on railing posts.

If the maximum allowable gradient cannot be maintained, it is still preferable to use a ramp, as a steep ramp is easier to negotiate than steps and a





DOORS

Doors should have a minimum clear opening of 32" and the threshold should be flush with the floor. Vertical bar type pull handles should be used that allow the door to be opened by a single effort. A delay-type self-closer is recommended.

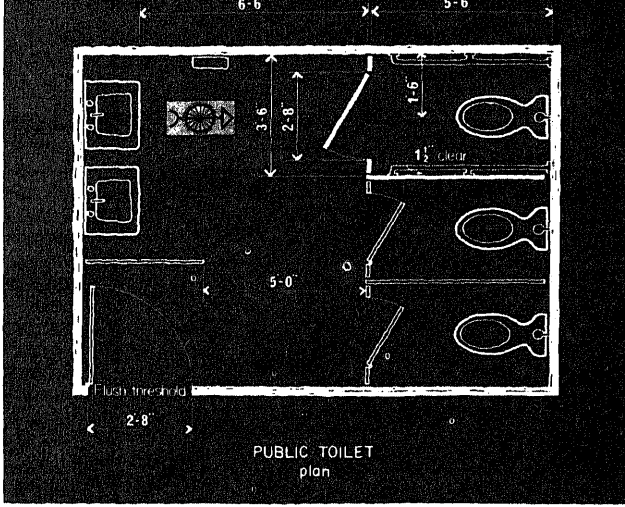
CONCESSION STANDS OR RESTAURANTS

Food service areas should provide one or more counter locations and serving tables where wheelchair users may be served.

Special building access and adequate room for circulation of wheelchairs should be provided. Tables constructed with recessed supports allowing the wheelchair arm to slide under should be installed.

TELEPHONES

Public telephone installations of the post-mounted type, avoiding the use of booths, would allow the majority of handicapped persons, including wheelchair users, to have sufficient access to the dial and receiver to use the phone unaided.



TOILET FACILITIES

Proper access to toilet facilities for the disabled park visitor is of basic importance. If the comfort station is above grade the wheelchair user will require a ramp with enough level area on both sides of the door so that he may open the door without aid.

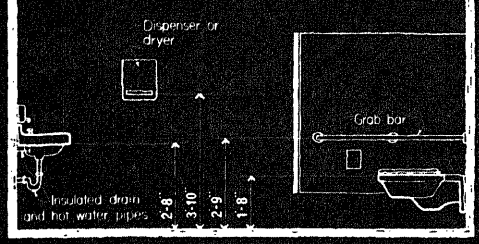
Urinals should be floor-mounted or, if wall-mounted the basin should be no higher than 19" above the floor, and equipped with a horizontal handrail. The flushing device must be within easy reach of the wheelchair user.

Lavatories should be wall-hung with narrow aprons and plumbing should be placed as high as possible under the lavatory to avoid striking legs and chair. Hot water pipes must be well insulated and faucet controls of the lever type are recommended.

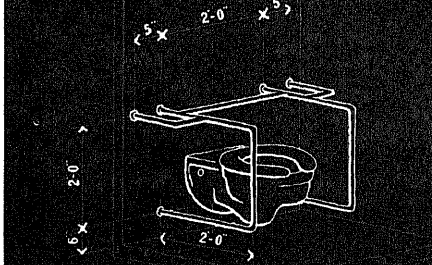
The hand dryer, soap dispenser and mirror should be placed lower than usual. Circulation within comfort stations should be carefully checked for adequate wheelchair clearance and turning radii.

DRINKING FOUNTAINS

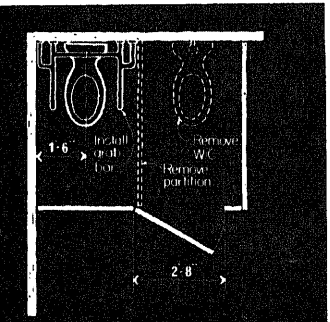
Drinking fountains should be placed at a convenient height and should project from wall. Stepping blocks, often provided for the convenience of children, should be omitted or located so as not to inter-



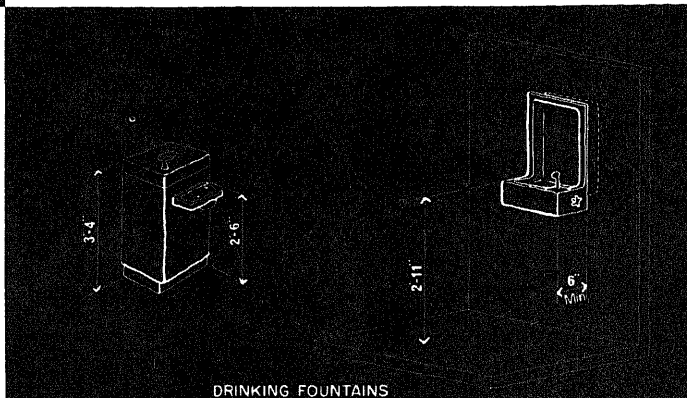
PUBLIC TOILET
section



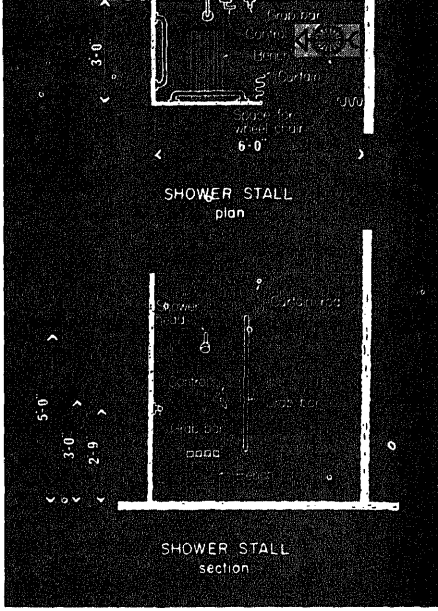
STRADDLE—TYPE GRAB BARS



ENLARGING EXISTING
W.C. STALL



DRINKING FOUNTAINS



RECREATION AREAS

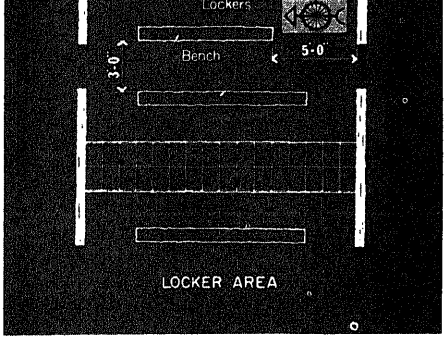
SWIMMING POOLS

Any existing pool may be easily adapted for use by the handicapped by simply adding a recessed area with broad steps at one corner or side on the shallow end where weak or elderly persons may sit in the water. Sloping handrails provide safe entry into the pool by the physically handicapped and elderly.

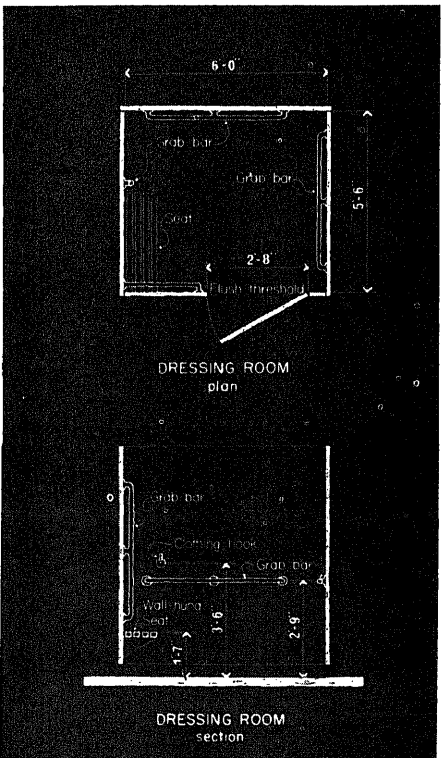
A safe and convenient place for parking wheelchairs and storing braces, crutches and prosthetic appliances should be provided near these steps.

At lakes or beaches a paved walk leading to and along the waters would give access for the physically handicapped. Entry into the water may be accomplished by a series of lifelines of nylon rope mounted on posts and extending from the paved walk into the lake to a limited depth. These lines should be spaced at 20-foot intervals normal to the shore with water depths marked on each post.

Bathhouse entry should be designed with particular attention paid to wheelchair circulation and clearance. In locker areas benches should be eliminated in front of lockers designated for wheelchair users. Dressing stalls for wheelchair users should be enlarged, equipped with a bench, grab rails, and a door that swings outward. The washroom floor should be level with no curbs and pitched only about ¼" in 0'-0" toward the floor drains in the shower stalls only. Curtains are preferable to doors. Hot water

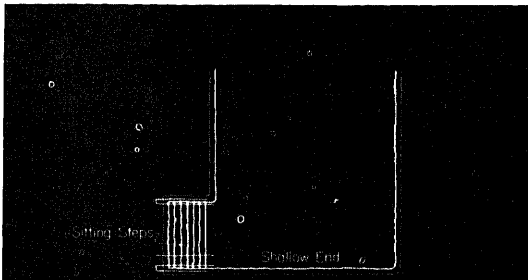


LOCKER AREA



DRESSING ROOM
plan

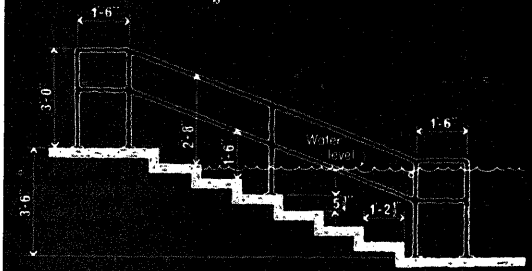
DRESSING ROOM
section



SWIMMING POOL



POOL STEPS
plan



POOL STEPS
section

SPECTATOR AREAS

The provision of special areas for the handicapped to watch active sports allows at least a minimal type of participation to almost any handicapped person.

Spectator areas should be located as closely as possible to the sport area and protection from sun, rain and misdirected balls or other playing objects is necessary. A small shelter with good access, a firm floor, with the type of benches recommended, plus parking areas for wheelchairs is all that is required.

CAMPING

Camping for the disabled requires but little change in the plans of the standard tenting campsite. Campsites for the disabled should be arranged in a cluster including a comfort station and washhouse 300 feet or less from the individual campsite. Trails and walks in the immediate area should be in accordance with standards previously noted. Access to the camper's store and recreation hall should also be provided.

These campsites should be reserved for use by disabled persons and their families and application for reservations should be made in advance through the Park Administrator.

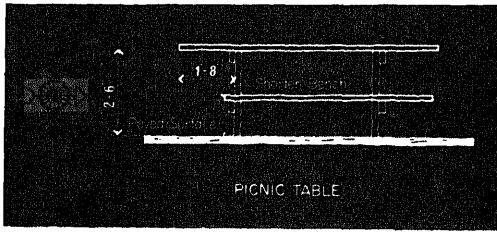
PICNICKING

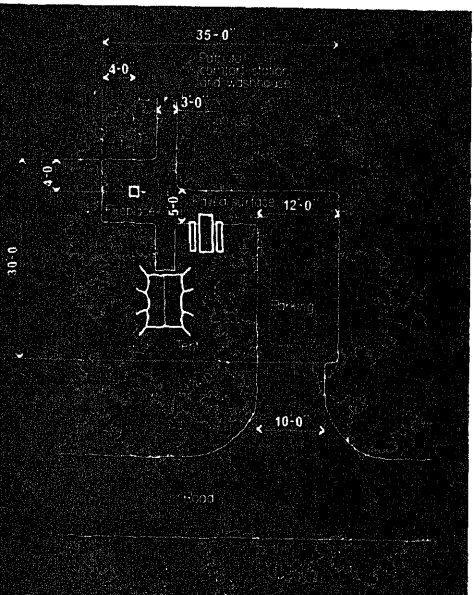
Good access to the picnic site, a comfort station less than 300 feet away, a nearby drinking fountain and a firm level surface around the table and raised fireplace is all that is required to accommodate wheelchair users and other disabled persons.

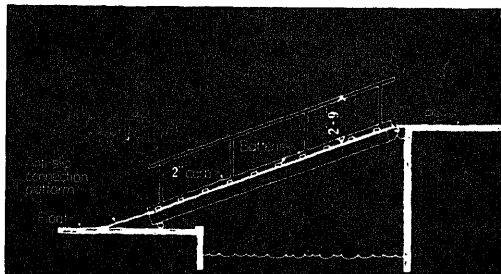
BOATING

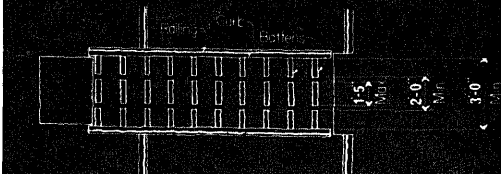
Boat docks or piers specially designated for use by the handicapped should be provided with a guard rail for safety. Entry into a boat from a dock can be accomplished by the wheelchair user by a ramp or gangplank.

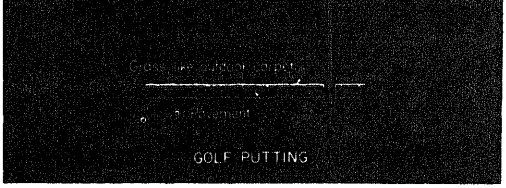
BENCH SHORTENED FOR WHEELCHAIR SPACE



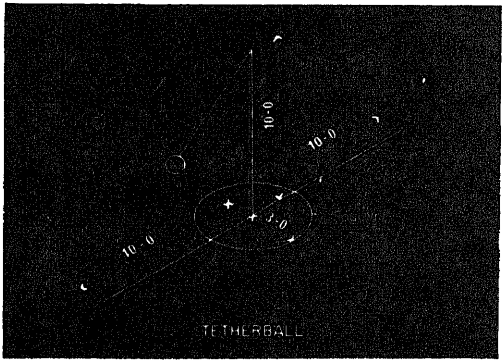


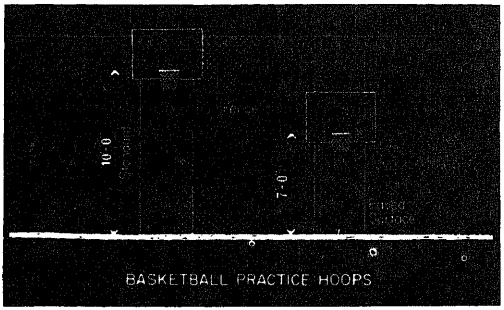




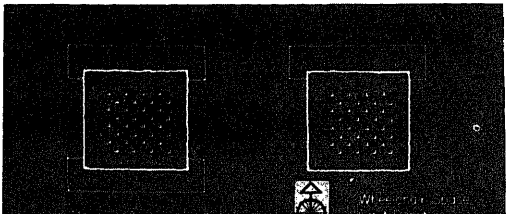


FIRM PAVEMENT UNDER SYNTHETIC GRASS FOR WHEELCHAIR USER





BASKETBALL HOOP LOWERED FOR WHEELCHAIR USER



Individuals in wheelchairs may take part in activities such as volleyball, basketball, shuffleboard, boccie, croquet, tetherball, golf putting on special greens, table tennis, horseshoe pitching, kite flying, badminton, baseball pitching, target and skeet shooting and archery. Certain disabled persons with more mobility may, in addition, ride bicycles or horses, use most playground equipment and practice handball or tennis on a backboard. Few of these activities require adaptation of existing facilities. Suggested changes in some equipment and layout to make them more useful to the disabled are shown.

Table games such as checkers or chess are popular with the elderly and require only tables set in a shaded or protected location.

WINTER SPORTS

The ability to participate in winter sports depends directly upon the degree of physical impairment. Persons in good physical condition, disabled by the loss of one arm or leg, may engage in any of the more strenuous sports. Many elderly individuals or persons on crutches or confined to wheelchairs may enjoy sledding, sleighriding, tobogganing or snowmobiling on a limited scale. No special adaptation of facilities are recommended for the handicapped who may wish to take part in winter sports.

FISHING

Fishing is a very desirable activity for disabled persons as it requires little exertion, allowing almost any disabled person to participate.

Access to good fishing water is of prime importance and may be accomplished by providing nearby parking and paved walks leading to fishing piers. Fishing in small streams may require only a paved turnout with a protective handrail along the stream bank.

HIKING

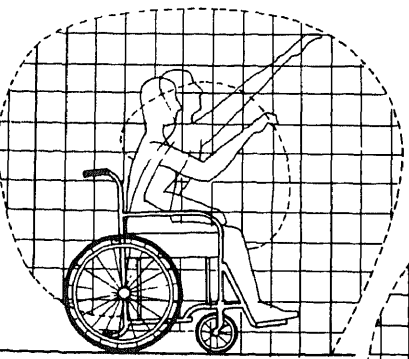
All trails cannot be constructed for wheelchair users along their entire length; however, spur or looped trails leading to scenic or historic sights should be considered. Trail construction should follow recommendations for walks and paths.

EDUCATIONAL AND CULTURAL INSTITUTIONS

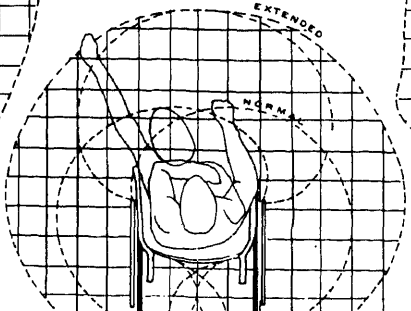
Auditoriums, interpretative centers and museums should be designed with the disabled visitor in mind. Parking, building access, wheelchair circulation and toilet facilities should follow recommendations cited earlier in this handbook.

In the case of auditoriums with fixed seating an occasional seat on the aisle should be eliminated to create a space for use by a wheelchair.

The wheelchair has been the determining factor in the design of special equipment for the handicapped.

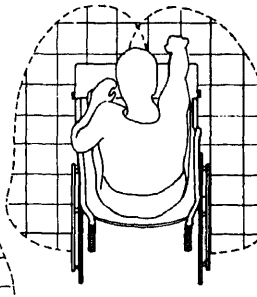


ERTICAL PLANE



NORMAL AND EXTENDED RE
FROM WHEEL CHAIR

(Average Normal M



HORIZONTAL PLANE AT FL

sed by permission of

PUBLIC RELATIONS

It is important that whenever a new park is constructed, or an old one altered with special provisions made for the disabled, that this information be widely disseminated so that disabled persons may seek out these parks and make use of these special conveniences.

Veterans organizations, volunteer civic groups interested in the physically handicapped, schools and various other institutions working with the handicapped will welcome this information and can help to guide disabled persons to parks with special facilities for their particular use.

The following individuals and organizations provided significant information and cooperation in the preparation of this handbook:

Dr. Elliot Avedon, Teachers College, Columbia University
Dr. Edith Ball, School of Education, New York University
American Foundation for the Blind
Associated Y's of Greater New York
Human Resources Foundation, Albertson, New York
Institute of Physical Medicine and Rehabilitation, New York City
International Society for the Rehabilitation of the Disabled, New York City
National Health Education Committee, New York City
National Recreation and Park Association, Washington, D.C.
New York State Department of Health
New York Telephone Company
Paralyzed Veterans of America, Committee on Architectural Barriers, New York City
U.S. Department of Health, Education and Welfare, Vocational Rehabilitation Administration
U.S. Department of the Interior, Bureau of Outdoor Recreation
U.S. Public Health Service, National Health Survey

Additional information on planning for the physically handicapped can be obtained from the following sources:

American Standards. *Specifications for Making Buildings and Facilities Accessible to, and Usable by, the Physically Handicapped.* New York.

Athletic Institute, The. *Planning Areas and Facilities for Health, Physical Education and Recreation.* The Institute, Chicago, 1965.

Avedon, Elliott M. "Outdoor Facilities for the Aged and Disabled," *Parks and Recreation.* May, 1966, 1:5:426-429, 441.

Bureau of Outdoor Recreation. *Planning for Disabled Persons.* Technical Bulletin, Work in progress, Washington, D.C. Dept. of the Interior.

Daniels, A.S. & Davies, E.A. *Adapted Physical Education: Principles and Practice of Physical Education for Exceptional Students.* Harper & Row, New York City, 1965.

Goldsmith, Selwyn. *Designing for the Disabled.* Royal Institute of British Architects Technical Information Service, London, 1963.

Hunt, Valerie V. *Recreation for the Handicapped.* Prentice-Hall, Inc., Englewood Cliffs, New Jersey, 1962.

National Building Code. *Building Standards for the Handicapped.* Ottawa, Canada, National Research Council, 1965.

Pomeroy, Janet. *Recreation for the Physically Handicapped.* Macmillan Co., New York, 1964.

President's Committee on Employment of the Physically Handicapped and the National Society for Crippled Children and Adults, "Architectural Barriers and the Handicapped." (Special Reports)

Salmon, F. Cuthbert & Christine F. *Rehabilitation Center Planning: An Architectural Guide.* The Pennsylvania State University Press, University Park, Pennsylvania.

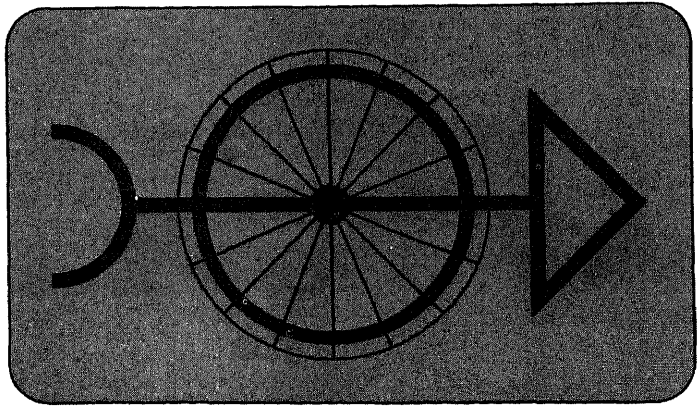
Vermilya, Howard P. "Building and Facility Standards for the Physically Handicapped." *Architectural Record,* December, 1962.

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Assistant Director, State Parks
Assistant Secretary

This handbook was prepared for the
State Council of Parks and
Outdoor Recreation
by
Vollmer Ostrower Associates

Arnold H. Vollmer, Partner-in-Charge
Margot Wellington, Project Director
Elliott M. Avedon, Ed.D., Research Consultant
Robert L. Elgin, Editorial Consultant



This symbol means that a facility has been made easily accesssible to the handicapped person. It does not preclude its use by others.

The BOCA *Basic Building Code* | 1975

SIXTH EDITION

As recommended and maintained
by the active membership of

BUILDING OFFICIALS & CODE ADMINISTRATORS INTERNATIONAL, INC.
1313 East 60th St. • Chicago, Illinois 60637
Founded in 1915 312/947-2580

SECTION 316.0 PHYSICALLY HANDICAPPED AND AGED

316.1 Applicability: The provisions of this section shall apply to all levels and areas used by the general public, employees, persons visiting or on the premises for any reason and shall apply to all use groups except R-3 and T.

316.1.1 Modifications: Where it can be demonstrated that one (1) or more of the following provisions is not applicable to the proposed use and occupancy, modifications may be sought under the provisions of Section 110.0.

316.2 Special requirements

316.2.1 Residential (R-1) use: At least one (1) bedroom unit for every twenty-five (25) bedroom units or fraction thereof in use group R-1 (residential, hotels) buildings shall be made accessible to the physically handicapped persons. The bedroom units allocated for the physically handicapped shall be proportionately distributed throughout all types of units.

316.2.2 Residential (R-2) use: At least one (1) dwelling unit for every twenty-five (25) dwelling units or fraction thereof in use group R-2 (residential, multi-family) buildings shall be made accessible to the physically handicapped persons. The dwelling units allocated for the physically handicapped shall be proportionately distributed throughout all types of units.

316.3 Building entrance: At least one (1) primary entrance at each grade floor level of a building or structure shall be accessible from the parking lot or the nearest street by means of a walk uninterrupted by steps or abrupt changes in grade and shall have width of not less than five (5) feet and a gradient of not more than one (1) foot in twenty (20) feet or a ramp meeting the requirements of Section 615.0. This entrance shall comply with requirements of Section 612.0.

316.4 Parking lots and building approaches: A parking lot servicing each entrance described in Section 316.3 shall have a number of level parking spaces as set forth in the following Table 316.4, identified by

Table 316.4
ACCESSIBLE PARKING SPACES

Total parking in lot	Required number of accessible spaces
up to 25	1
26 to 50	2
51 to 75	3
76 to 100	4
101 to 150	5
151 to 200	6
201 to 300	7
301 to 400	8
401 to 500	9
501 to 1000	2% of total
over 1000	20 plus 1 for each 100 over 1000

above grade signs as reserved for physically handicapped persons. Each reserved parking space shall be not less than twelve (12) feet wide.

316.4.1 Parking spaces: Parking spaces for the physically handicapped shall be located as close as possible to elevators, ramps, walkways, and entrances. Parking spaces should be located so that the physically handicapped persons are not compelled to wheel or walk behind parked cars to reach entrances, ramps, walkways and elevators.

316.4.2 Curbs: Where a curb exists between a parking lot surface and a sidewalk surface, an inclined curb approach or a curb cut with a gradient of not more than one (1) foot in twelve (12) feet and a width of not less than four (4) feet shall be provided for wheelchair access.

316.5 Interior access: Interior means of access to all floor levels shall be provided by ramps meeting the requirements of Section 615.0 or elevators, and access to all points on each floor level shall be provided by means of passageways, corridors, and doorways meeting the requirements of Sections 610.0, 612.0 and 625.0.

316.6 Electrical switches, controls, and fire alarms: Light switches, controls, fire alarms, etc., shall be located not more than four (4) feet above the floor.

316.6.1 Telephones: Where a public or pay phone is installed, five (5) per cent or not less than one (1) telephone shall be accessible to, and usable by, physically handicapped persons. Such telephones shall have the dial, coin slot, and handset not more than fifty-four (54) inches above the floor.

316.7 Elevator requirements: If interior access in multi-story buildings is provided by elevator(s), at least one (1) elevator shall meet the following requirements listed below.

1. The elevator cab shall have a clear area of not less than twenty-five (25) square feet with a minimum dimension of fifty-six (56) inches.

2. The elevator door shall have a minimum clear opening width of thirty-two (32) inches.
3. The floor and control buttons shall be located not more than sixty (60) inches above the floor.
4. Braille plates shall be provided adjacent to all cab control buttons and switches.
5. Braille plates shall be provided for floor designation on each floor, sixty (60) inches above the floor, on the fixed point at the open side of the elevator door.

316.8 Access to plumbing fixtures

316.8.1 Toilet rooms: At least one (1) toilet room and one (1) fixture within such room shall be accessible to and usable by, physically handicapped persons. A toilet room shall have a clear space beyond the room door swing of not less than sixty (60) inches by sixty (60) inches.

316.8.2 Water closet stall: The clear width between the face of a water closet stall and a wall shall be not less than forty-eight (48) inches. A water closet stall shall be not less than forty-two (42) inches wide, seventy-two (72) inches deep, and have an out-swinging door at least thirty-two (32) inches wide or an opening at least thirty-two (32) inches wide. Handrails shall be provided on both sides of the water closet that are not less than forty-two (42) inches long and mounted thirty-three (33) inches above and parallel to the floor, with the front end positioned twenty-four (24) inches in front of the water closet. Handrails for children shall be twenty-eight (28) inches above the floor.

316.8.3 Water closet: A water closet shall have a seat seventeen (17) inches from the floor, [fifteen (15) inches for children], and have a narrow understructure that recedes sharply from the front. The trap shall not extend in front of, or be flush with, the lip of the bowl. Where only one (1) water closet is required in the facility, a standard height model may be used.

316.8.4 Urinal: Toilet rooms for men shall have a wall mounted urinal with the opening of the basin nineteen (19) inches from the floor, or shall have floor-mounted urinals that are level with the main floor of the toilet room.

316.8.5 Drinking fountain: Where a drinking fountain is required, five (5) per cent or not less than one (1) drinking fountain or other water dispensing means shall be accessible to, and usable by physically handicapped persons. A floor type, wall-mounted, or semi-recessed (fully-recessed not acceptable) drinking fountain or cooler shall have a spout and hand control near the front of the unit with the basin located not more than thirty (30) inches above the floor, and shall also be operated by means of a foot pedal.

316.8.6 Miscellaneous: A shelf, disposal unit, or the lower edge of a mirror shall not be more than forty (40) inches above the floor. A towel

and/or sanitary napkin dispenser (paper level) or electric hand dryer shall not be more than forty-eight (48) inches above the floor.

316.9 Assembly seating accommodations: Places of assembly with fixed seating arrangements shall provide viewing positions for persons in wheelchairs in accordance with the following Table 316.9.

Table 316.9

PLACES OF ASSEMBLY, ACCESSIBLE VIEWING POSITIONS

Capacity of assembly space	Number of viewing positions
up to 25	1
26 to 50	2
51 to 75	3
76 to 100	4
101 to 150	5
151 to 200	6
201 to 300	7
301 to 400	8
401 to 500	9
501 to 1000	2% of total
over 1000	20 plus 1 for each 100 over 1000

316.9.1 Location: Viewing positions for wheelchair persons shall be provided in a reasonable and convenient section or sections of the facility by providing clear space devoid of any fixed seating arrangements. These positions shall be located so as not to interfere with egress from any row of seats, shall be reached by means of ramps and/or elevators, and shall not infringe upon aisle requirements.

316.9.2 Access: There shall not be steps in the aisles or in the access route used by the physically handicapped to reach the performance viewing positions, but the aisles may be inclined according to the provisions of Section 615.0.

316.10 Checkout lanes: Buildings which include checkout lanes shall provide at least one (1) checkout lane, on each floor where such lanes are used, which is not less than thirty-six (36) inches wide.

316.11 Turnstiles: Buildings which utilize turnstiles to control traffic shall provide a clearly marked alternate route for the physically handicapped which is at least thirty-six (36) inches wide.

Access



INTERNATIONAL SYMBOL OF ACCESS FOR THE HANDICAPPED

For display on public buildings, hotels, motels, theaters, restaurants, stores, parking lots, and transportation facilities which are fully accessible to wheelchair users and other persons with limited mobility.

Greater
Kansas City

A C C E S S

a compilation of graphic illustrations, information and ideas to be used in making new and remodeled 'public' buildings accessible and usable by the physically handicapped wheelchair user and other persons with limited mobility.

Prepared by

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Council of Handicapped Citizens
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Kansas City, Missouri 64108

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3947 State Line, Kansas City, Missouri 64111

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Greater Kansas City Council
of Handicapped Citizens
3011 Baltimore
Kansas City, Mo. 64108

INTERNATIONAL SYMBOL INDICATING
BUILDING ACCESSIBILITY

All items listed under REQUIREMENTS must be met to qualify for displaying this symbol. Check the following that apply to your facility.

REQUIREMENTS

_____ A ground-level entrance to a building, or a major entrance having a ramp (ratio 1' in 12') in lieu of steps.

_____ A doorway which is 32" wide to permit passage of a wheelchair - doors that open with one easy motion.

_____ Within the building, ramps instead of stairs (ratio 1' in 12') or access by the handicapped to elevators.

_____ Restrooms used by the public must have stall door openings not less than 32" wide with doors that swing out.

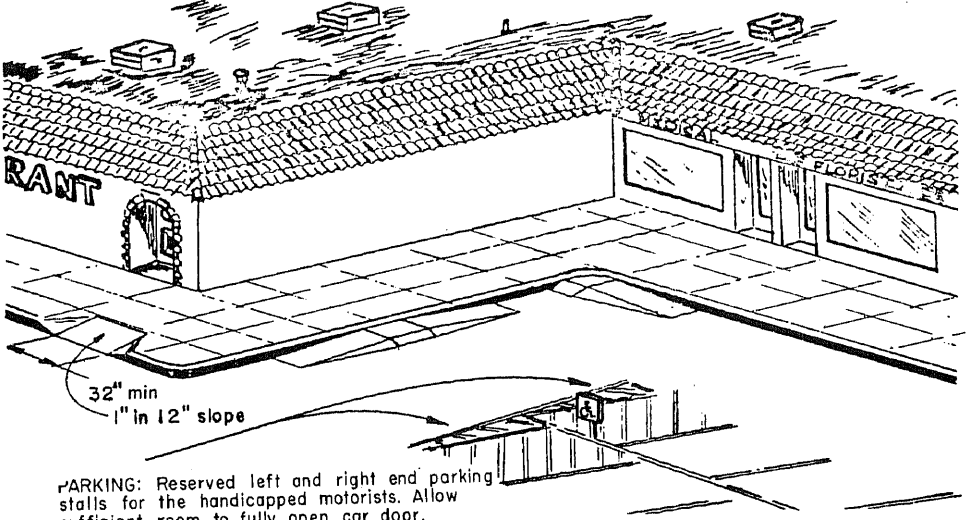
_____ Special parking spaces that are wider to provide room to transfer from auto to wheelchair.

_____ Provision for ramped or ground level access from parking area to sidewalk.

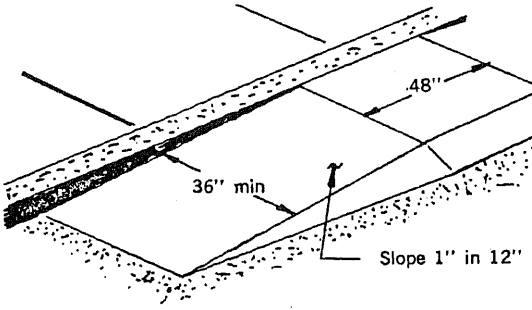
_____ Within the building, uniform doorway widths of 32" permitting access to offices and connecting work areas.

_____ Grab bars in restroom stalls.

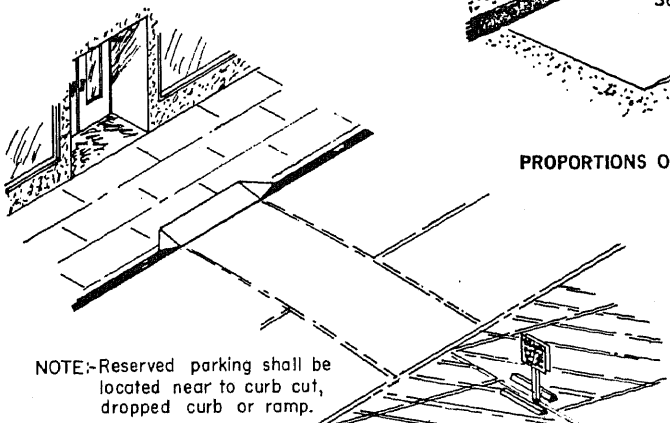
RECOMMENDED



PARKING: Reserved left and right end parking stalls for the handicapped motorists. Allow sufficient room to fully open car door. Identify stalls.

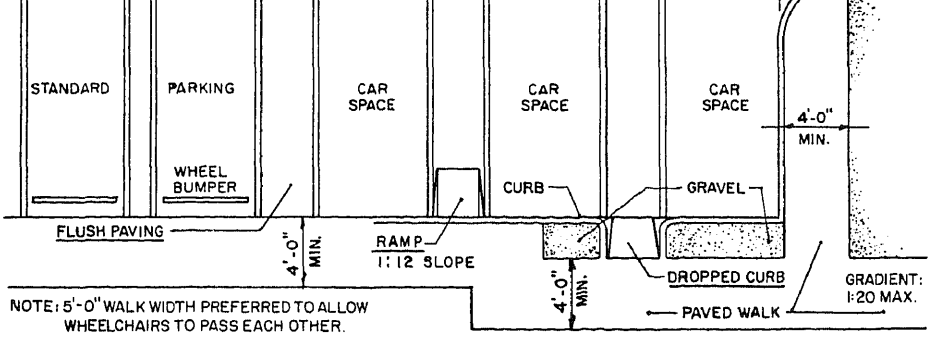


PROPORTIONS OF A TYPICAL RAMP

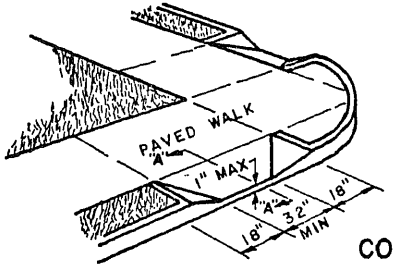


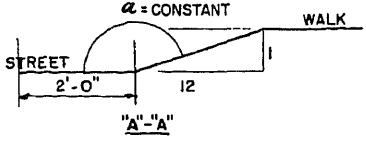
NOTE:-Reserved parking shall be located near to curb cut, dropped curb or ramp.



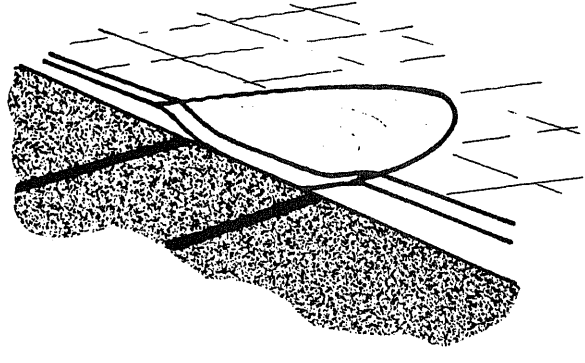


DROPPED CURB

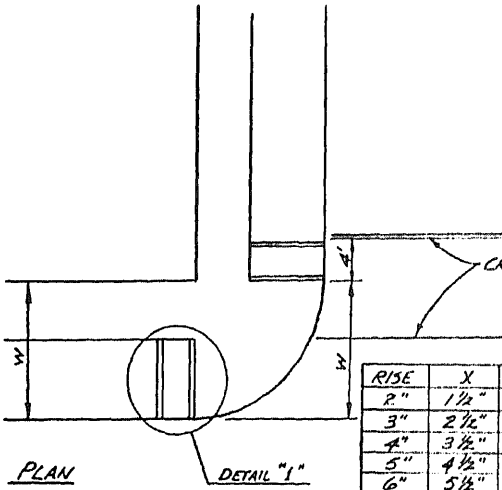




CONCAVE DEPRESSED CURB



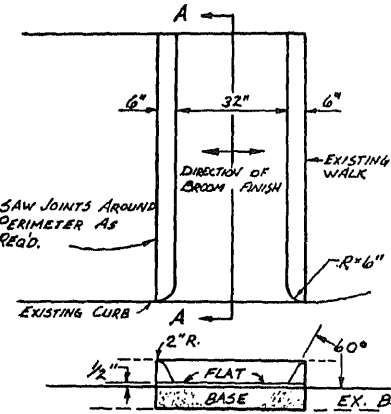
CURB CUTS

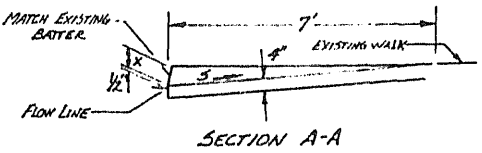


PLAN

DETAIL "1"

RISE	X	S	Yd³ Conc.
2"	1½"	1.78%	.32 CY
3"	2½"	2.97%	.33 CY
4"	3½"	4.16%	.34 CY
5"	4½"	5.35%	.35 CY
6"	5½"	6.54%	.36 CY
7"	6½"	7.73%	.37 CY
8"	7½"	8.92%	.98 CY



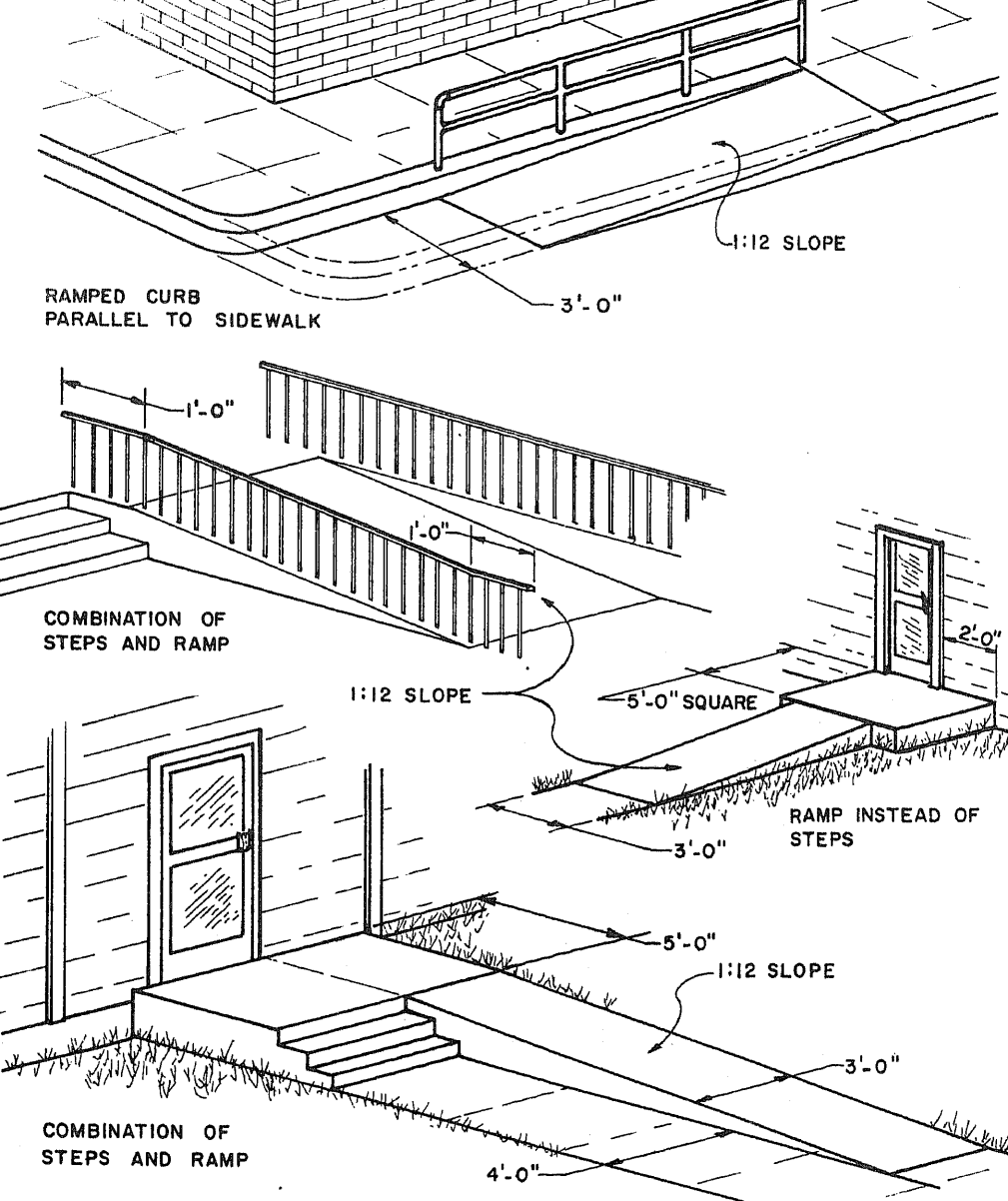


SECTION A-A

DETAIL "1"

NOTES

1. VERTICAL CURB FACES ON RAMPS
2. MAXIMUM GRADE BREAK @ FLOW
7. MAXIMUM X=8".
8. APPLY HEAVY BROOM FINISH TO



RAMPED CURB
PARALLEL TO SIDEWALK

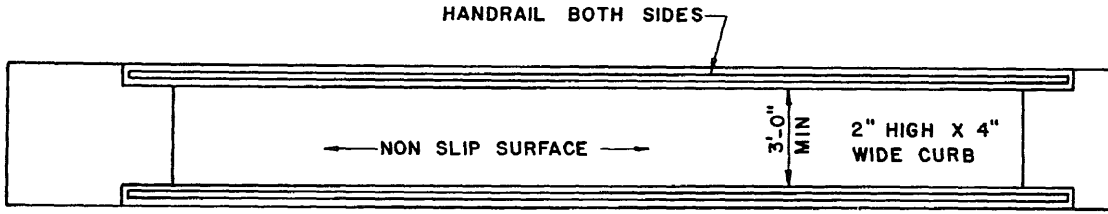
COMBINATION OF
STEPS AND RAMP

RAMP INSTEAD OF
STEPS

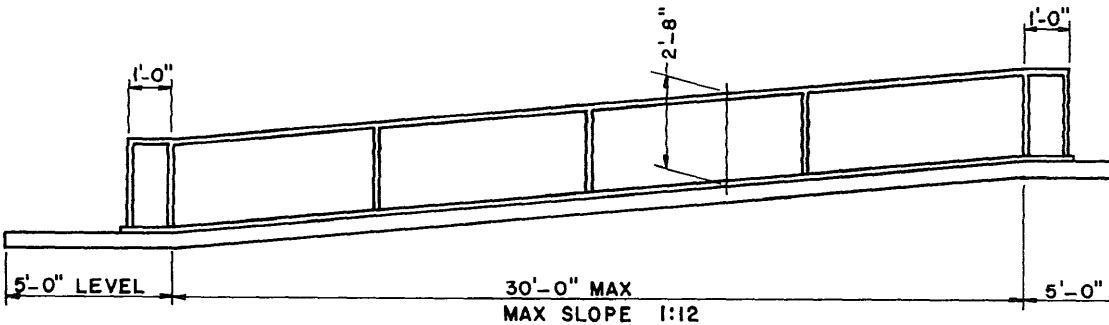
COMBINATION OF
STEPS AND RAMP

RAMP

FOR GRADIENT OF 1:12 OR LESS

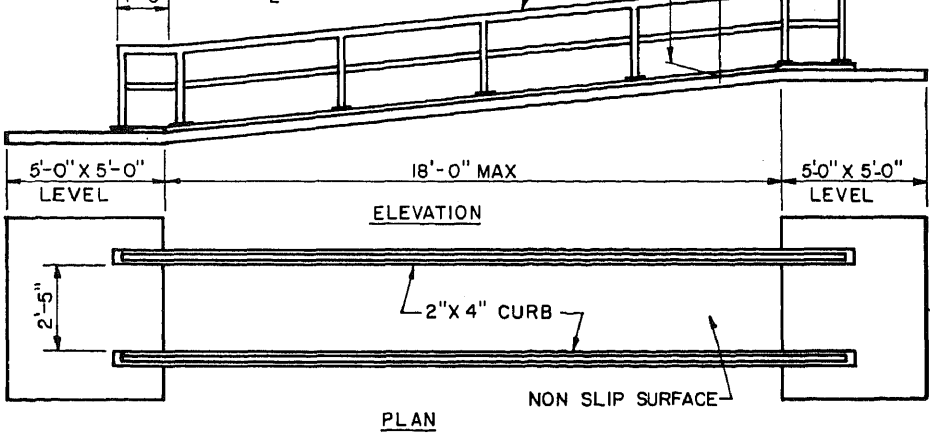


PLAN



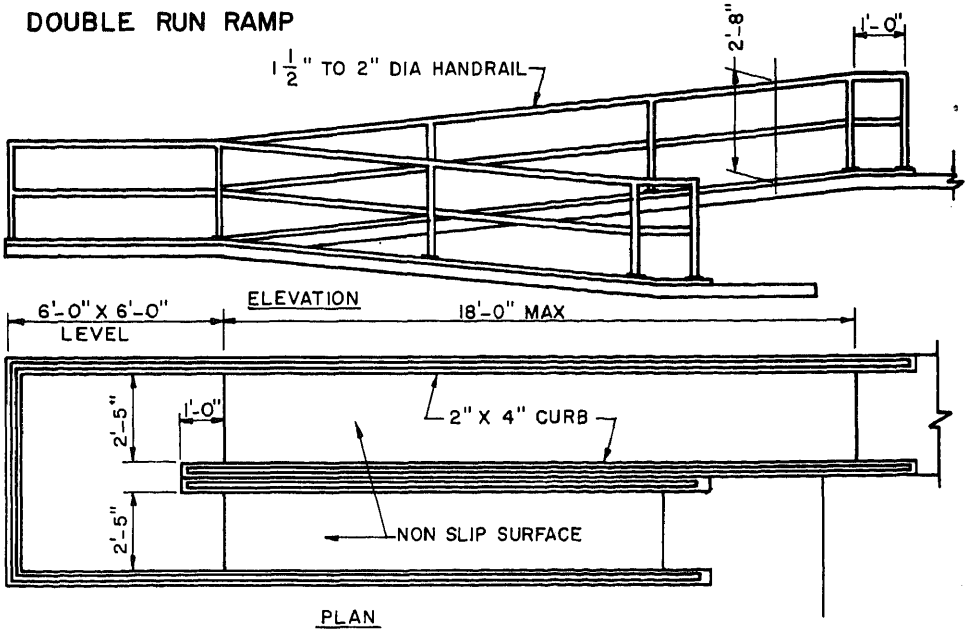
ELEVATION

NOTE: RAMP MAY EXCEED 3'-0" WIDTH.
RAMP MAY BE ADAPTED TO INSIDE OR OUTSIDE USE.



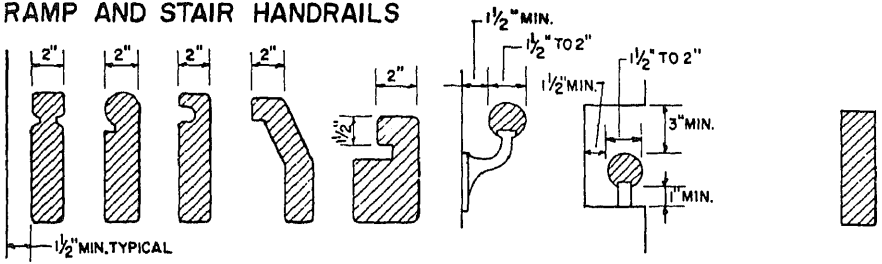
NOTE: MAX RUN OF RAMP SHALL NOT EXCEED 18'-0" WITHOUT A REST PLATFORM.

DOUBLE RUN RAMP



NOTE: MAX RUN OF RAMP SHALL NOT EXCEED 18'-0" WITHOUT A REST PLATFORM.

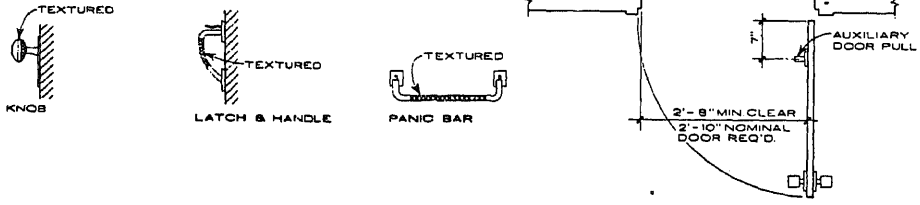
RAMP AND STAIR HANDRAILS



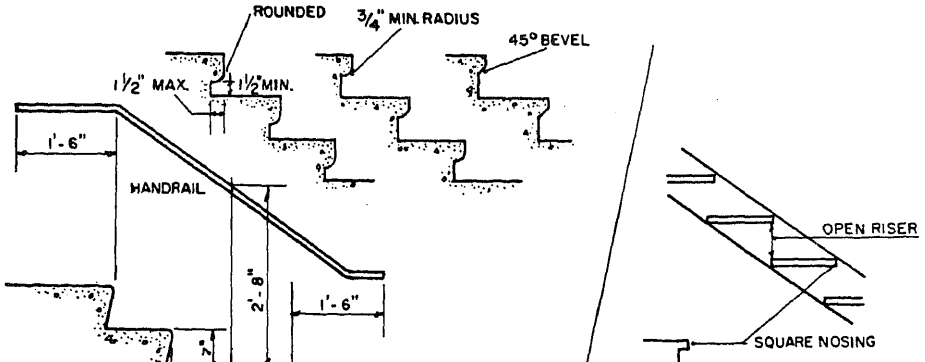
ACCEPTABLE TYPES OF HANDRAILS – OTHER EASY TO GRIP TYPES ACCEPTABLE

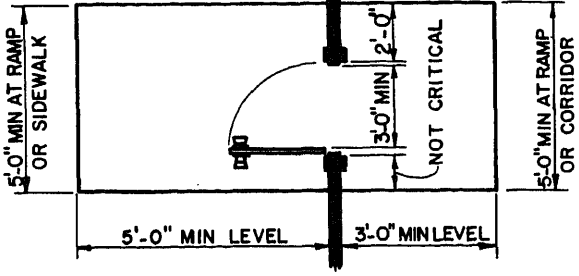
UNACCEPTABLE
DIFFICULT TO GRIP

DOOR HARDWARE

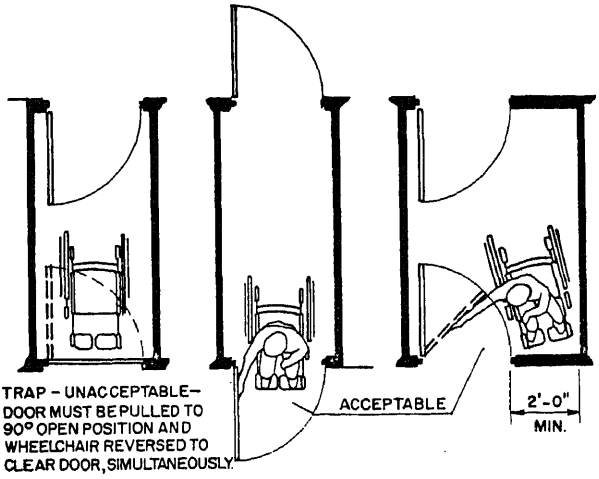


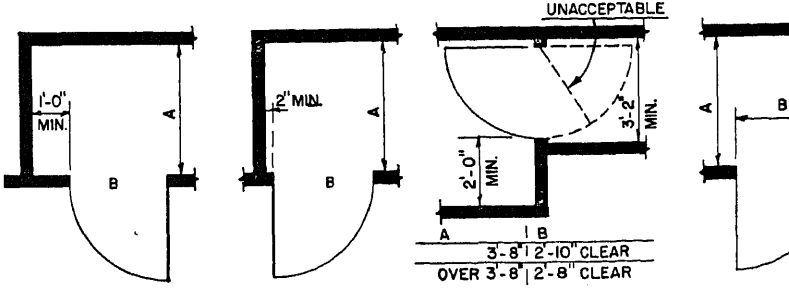
STAIRS



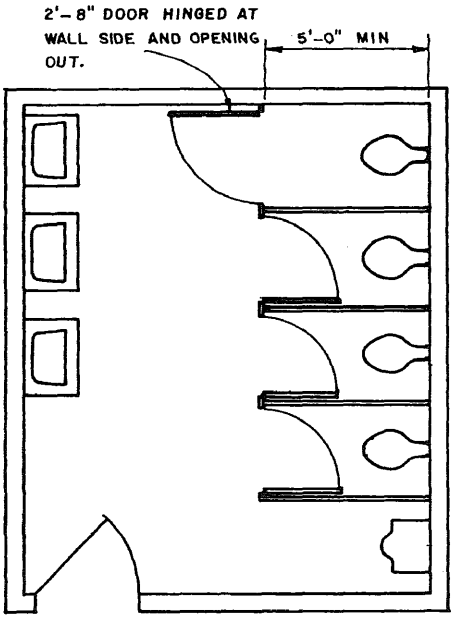


SINGLE OUTSIDE DOOR

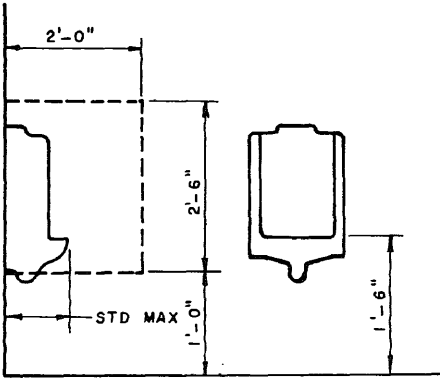




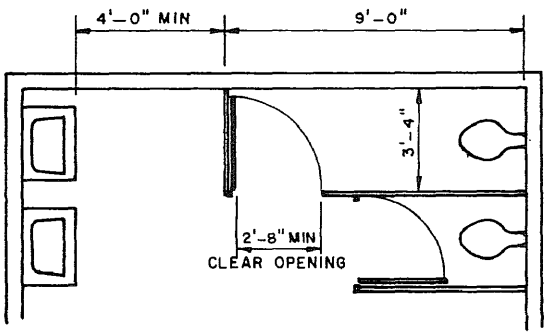
PARAPLEGIC TOILET STALL SCHEME



SUGGESTED PLACEMENT OF WIDE STALL WITH OUTSWINGING DOOR

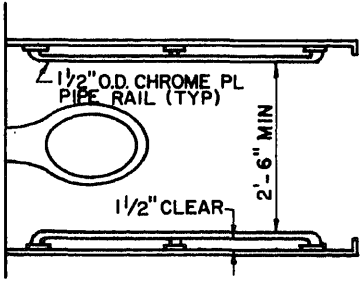


URINAL:- SUGGESTED DIMENSIONS SUITABLE PARAPLEGICS WITHOUT PARTITIONS OR WITH 36 BETWEEN PARTITIONS.

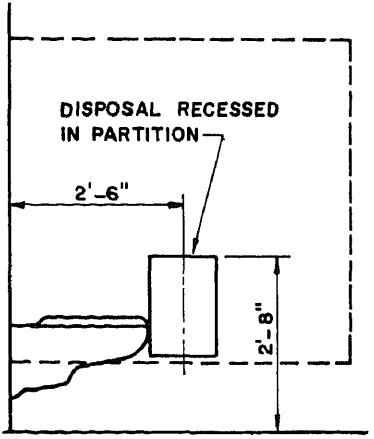


ALTERNATE TOILET STALL SCHEME

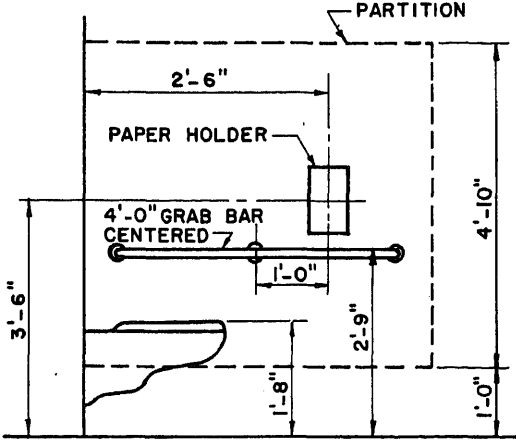
PARAPLEGIC TOILET DIMENSIONS & ACCESSORIES



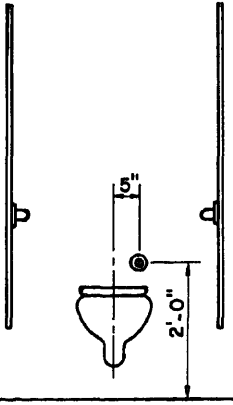
PLAN VIEW



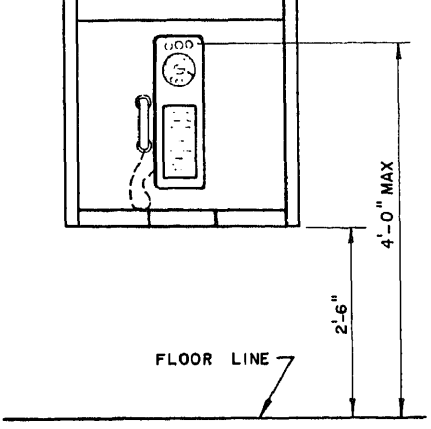
PLACEMENT OF FEMININE NAPKIN DISPOSAL



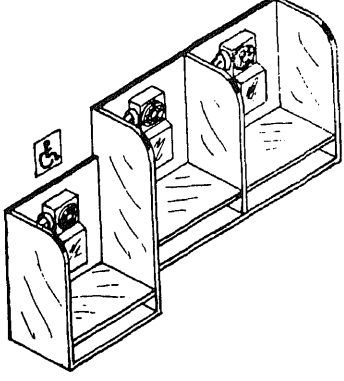
SIDE ELEVATION



FRONT ELEVATION

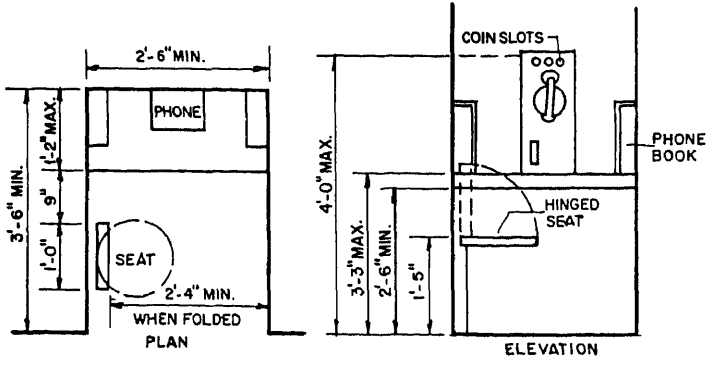


WALL MOUNTED



PLACE LOWERED TELEPHONE
AT THE END OF A BANK OF PHONES

NOTE :- HEIGHT TO DIAL OR COIN SLOT (WHICHEVER IS GREATER) SHALL NOT EXCEED 4'-0".
TELEPHONE SHALL BE EQUALLY USABLE BY ABLE, DISABLED AND SMALL CHILDREN.

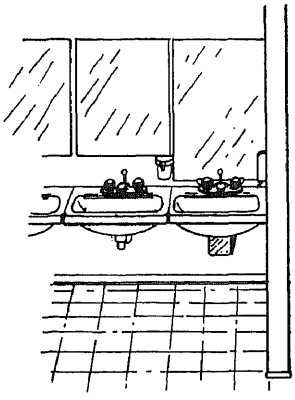


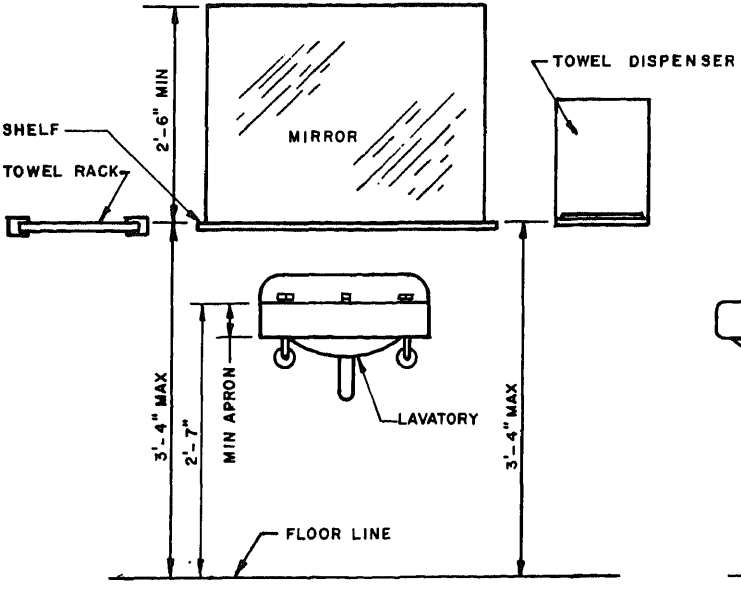
BOOTH

NOTE:-

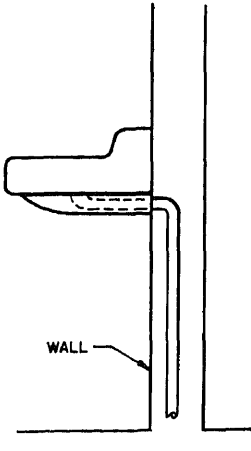
INSULATE EXPOSED HOT WATER PIPE AND DRAIN UNDER LAVATORY TO PREVENT BURNS TO WHEEL-CHAIR OCCUPANT.

HEIGHT OF TOWEL RACK, SOAP & TOWEL DISPENSERS, SHELF AND BOTTOM EDGE OF MIRROR SHALL BE 3'-4" MAX.



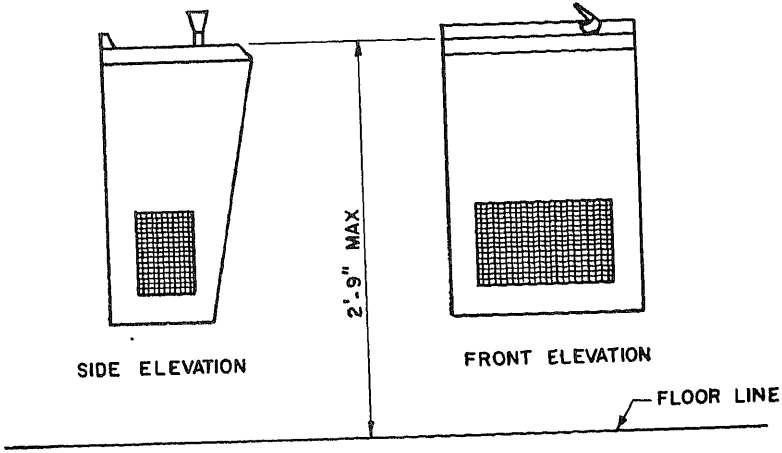


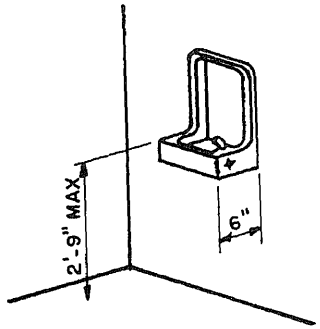
FRONT ELEVATION

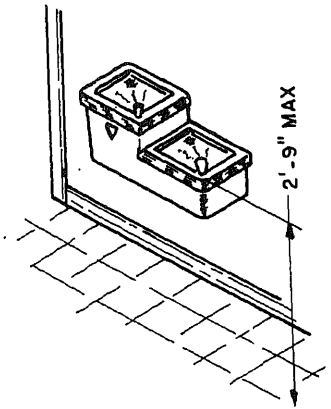


ALTERNATE
(PLUMBING IN WALL)

TYPICAL DRINKING FOUNTAINS







HAND ONLY OR HAND/FOOT WATER CONTROL

MISCELLANEOUS SPECIFICATIONS FOR PUBLIC BUILDINGS

Sidewalks
- a. Grade 1:20 (5%) or less
- b. 5' minimum width to allow wheelchairs to pass
- c. Sloped to blend with driveways
- d. May be curved to conform to terrain

Entrances
- a. One accessible entrance from sidewalk or parking lot or garage
- b. 36" wide easy pull door
- c. Level floor - 5' outside, 3' inside
- d. Accessible to elevator via level floor or ramp

Corridor, Hallway and Aisle
- a. 48" minimum width to allow wheelchair turn-around
- b. 60" minimum width to allow wheelchairs to pass
- c. 32" minimum width in cafeteria line, grocery and department store check-out, and other restricted areas.

Floor Surface
- a. Non-slip
- b. Level
- c. Different levels connected by ramps

Controls
- a. Switches, Dials, Thermostats and Controls for light, heat, air conditioning, ventilation, windows, fire alarm, telephone, intercom, television, draperies, vending machines, fuse boxes, gas and water supply, and elevator shall be between 33" and 48" above the floor and unobstructed
- b. Electric outlets: 18" to 24" above the floor
- c. Door knobs and handles 36" above the floor

Identification Signs
- a. Wheelchair: International Symbol of Access should be placed on accessible outside doors, accessible restrooms, toilet stalls, telephone and other selected areas such as; hotel room, viewing areas, trails or transportation facility
- b. Blind: (1) Raised Braille identification plates should be placed to the right of doorways, street crossings, sidewalks, etc. 5' above the floor
  - (2) Doors leading to dangerous areas should have knurled knobs and handles
  - (3) Ramps leading to streets should be broom finished
  - (4) Fire Exits should have "beep" signal
- c. Deaf
  - (1) All information and identification signs must be <u>visual</u>
  - (2) Fire alarms should be accompanied by a flashing light

GENERAL AIDS TO THOSE WITH LIMITED MOBILITY

A. Doors should open with 8 pounds or less pressure or pull.
B. Hand rails for all steps and ramps extending 18" beyond top and bottom of stair or ramp.
C. Round nose steps with no more than 7" rise and non-slip treads.
D. Threshold:
   (1) Outside, 1" maximum.
   (2) Inside, flush with floor.
E. Restrooms:
   Ambulatory handicapped use the same facilities as for wheelchair.
F. Lighting:
   Should be good on ramps, stairs, corridors, halls, entrances, exits, and parking areas.
G. Hazards:
   Hazards, obstacles, and unnecessary objects should be removed from all areas where persons with limited mobility travel.

ACKNOWLEDGEMENTS

City of Indianapolis - (Drawing on Page 4.)

"Check List and Graphic Illustrations." State of California (1974) John C. Worsley, A.I.A. State Architect. (Drawings on Pages 3, 6, 8, 9, 12, 13, and 14.)

"Standard Specifications for Facilities for the Handicapped." State of Illinois. Office of Supervising Architect. (Drawings on Pages 7, 10, 13, and 14.)

"Specifications for Making Buildings and Facilities Accessible to and Usable by the Physically Handicapped." American National Standards Institute, Inc., New York, New York A117.1 - 1961 (R1971) (All Drawings herein conform to the ANSI specifications.)

Paraplegia News - (Drawings on Pages 2, 12, 13, and 14.)

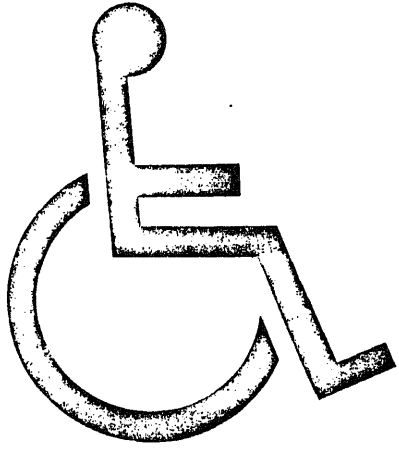
Jim Wrzesien, Architect - (Drawings on page 11.)

Bob Lawler, Winnetonka High School, North Kansas City, Missouri (Preliminary drawings)

Rehabilitation International - (International Symbol of Access: on the cover.)

CONSTRUCTION DETAILS

Planning For The Handicapped



STAIRS CURBS
NARROW DOORWAYS
SMALL RESTROOMS
HIGH DOOR SADDLES
WATER FOUNTAINS
ESCALATORS
PHONE BOOTHS
SMALL ELEVATORS
LACK OF PARKING
REVOLVING DOORS
STAIRS CURBS
NARROW DOORWAYS
SMALL RESTROOMS
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WATER FOUNTAINS
ESCALATORS
PHONE BOOTHS
SMALL ELEVATORS
LACK OF PARKING
REVOLVING DOORS

Committee To Eliminate Architectural Barriers

In

Westchester County

713 County Office Building White Plains, New York 10601

AN EASTER SEAL PROJECT
CONDUCTED BY THE WESTCHESTER COUNCIL OF SOCIAL AGENCIES

Barriers can be Broken



TELEPHONES WIDE ELEVATORS WIDE TOILET STALLS GRAB BAR
MIRRORS LOW TOWEL DISPENSERS ACCESSIBLE PARKING DROPPE
GROUND LEVEL ENTRANCES WIDE DOORS FLUSH DOOR SADDLES W
FOUNTAINS ACCESSIBLE PUBLIC TELEPHONES WIDE ELEVATORS WIDE
STALLS GRAB BARS ACCESSIBLE LAVATORIES LOW MIRRORS LOW TOWE
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For Checklist Aid
See Inside Back Cover

Most buildings are designed for the physically able. Architectural barriers are "features" built into buildings which make access and full use impossible for the handicapped. These include steps, revolving or narrow doorways, narrow toilet stalls, inaccessible water fountains, telephone booths and elevators.

An estimated 10% of our population (and this percentage is increasing each year), including those in wheelchairs, wearing leg braces, on crutches, blind or suffering from cardiac or arthritic conditions, are thereby denied full and useful lives.

The Committee to Eliminate Architectural Barriers in Westchester County was formed to bring awareness of this problem to you members of our community who can ensure that these barriers be eliminated in future planning and construction.

BEAR IN MIND:

* Physical design of buildings is the greatest single obstacle to employment of the handicapped.

* Communities which use the New York State Building Code and buildings covered by Federal Law 90-480 are required to comply with the regulations governing barrier-free architecture.

* Incorporation of these recommended standards in all buildings would fulfill a pressing community need.

* This program is endorsed by:

Westchester County Executive, Edwin G. Michaelian

Westchester Chapter, American Institute of Architects

Westchester Chapter, National Society of Professional Engineers

Westchester County Department of Health

Westchester County Department of Planning

Westchester County Department of Public Works

COMMITTEE TO ELIMINATE ARCHITECTURAL BARRIERS
in Westchester County
713 County Office Building, White Plains, N.Y. 10601

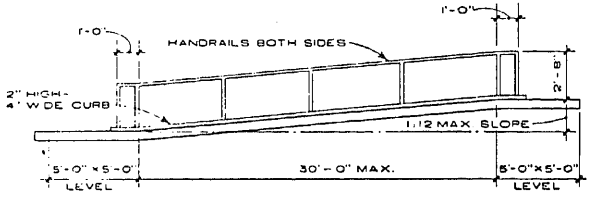
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AN EASTER SEAL PROJECT
CONDUCTED BY THE WESTCHESTER COUNCIL OF SOCIAL AGENCIES



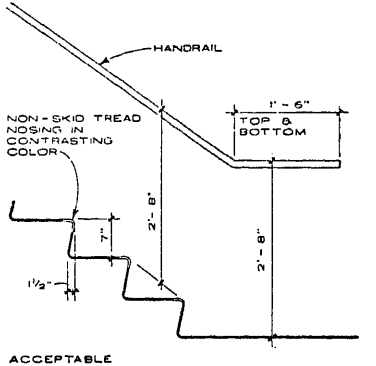
RAMPS

NOTE.

Avoid ramps if possible.
Ramp surface should be non slip
Ramp should be minimum 36" wide clear.

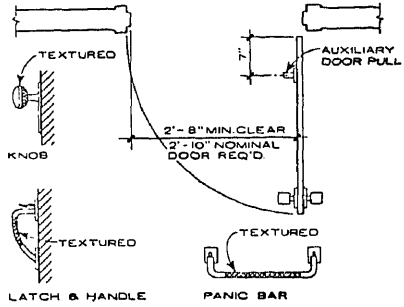
ACCESS

Access from main entrance sidewalk through the entrance to the elevator, and from the elevator to all of building planned for occupancy should be free of steps.



ACCEPTABLE

STAIRS



DOORS & HARDWARE

NOTE:

Provide 32" clear width when door is at 90°

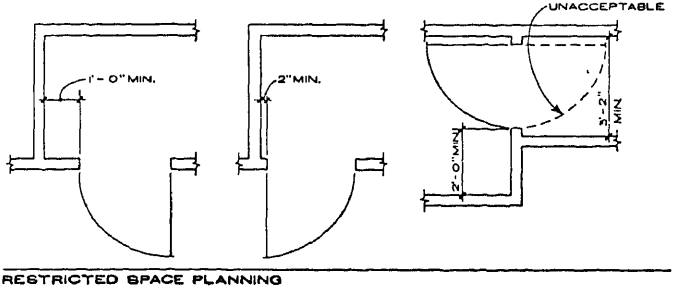
Plan door swings to open into larger spaces.

Auxilary door handle 7" from hinge edge as shown is recommended.

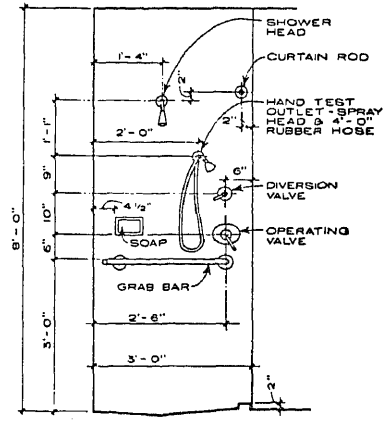
Door knob height and auxilary door handle height maximum 36"

Floor should be level on each side of door for distance of 5'-0" from door in direction it swings and 3'-0" from door in opposite direction it swings

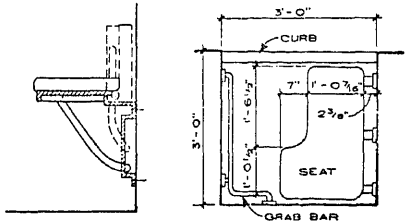
Hardware identification for blind – integral or applied textured surfaces as shown above.



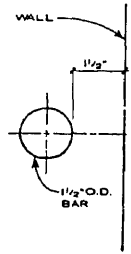
RESTRICTED SPACE PLANNING



ELEVATION
SHOWER STALL



ELEVATION PLAN
FOLDING SHOWER SEAT MODEL NO. U1-1
SHOWER



GRAB BAR

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DESIGN CHECKLIST

	Page
___ Parking Spaces	2
___ Wheelchair Dimensions	3
___ Sidewalks and Curbs	3
___ Ramps	4
___ Stairs	4
___ Doors, Doorways and Hardware	5
___ Drinking Fountains	6
___ Public Telephones	6
___ Lavatories	7
___ Public Toilets	7
___ Shower Stall	8
___ Showers	8
___ Grab Bar	8

POTENTIAL BARRIERS	RECOMMENDATIONS
___ Revolving Doors	Avoid where possible
___ Electrical Outlets	Minimum of 18" above floor level
___ Escalators	Replace with moving sidewalks
___ Door Opening Pressure	Not to exceed 8 pounds
___ Door Saddles	Flush with the adjacent floor
___ Elevators	Minimum cab – 5'-1" deep by 5'-6" wide Call buttons – maximum 3'-6" above floor Cab Controls – minimum 4'-6" above floor Minimize width of saddle opening
___ Room Identification	Use raised letters for touch identification
___ Hand Rails	32" above surface level of floor
___ Corridors	Minimum 5' wide to permit passing

FOR ARCHITECTS

WAYNE STATE UNIVERSITY

Educational Rehabilitation Services
and
Campus Planning Office
Wayne State University

February, 1971

NTRODUCTION

he following material has been prepared by the Edu-
ational Rehabilitation Services (ERS) at Wayne
tate University and has been reviewed by the Cam-
us Planning Office. Obviously, these listed require-
ents constitute only a summary of the most import-
nt considerations in planning a building which will
e usable by physically disabled persons. As such, it
rovides a starting place for the architect in his work.
o insure that each building is properly planned, the
anning Office has asked the director of ERS ,
lizabeth Ferris, to approve all plans, examine all ap-
ropriate details, and assist the architects in any way
e can. At whatever time you deem appropriate, the
anning Office will be happy to make suitable ar-
ngements for you to talk with Miss Ferris so that
e, in turn, can review your plans.

must be understood that the basic policy at Wayne
tate University is to plan all buildings so that they
e usable by physically disabled persons. It is as-
med that all academic, living and/or public areas of
building will be planned and usable by physically
sabled persons. WHENEVER THE ATTACHED
EQUIREMENTS EXCEED THOSE OUTLINED BY
HE STATE OF MICHIGAN BUILDING DIVISION,
NDER ACT I OF THE PUBLIC ACT OF 1966,
HE WAYNE STATE UNIVERSITY SPECIFICA-
IONS SHALL BE USED.

RS will supply each architect with a rubber stamp
be applied to shop drawings submitted of "handi-
pped" features. If you have any questions con-
rning the ensuing material, or if you would like
rther information concerning any point, please do
t hesitate to call Miss Ferris or the Planning Office.

ENERAL CONSIDERATIONS

disabled. Otherwise, deviations from stand
dimensions are often overlooked during bu
ing construction.

III Functioning of Individuals in Wheelcha

A. The average space required for turning
and 360 degrees is 60 x 60 inche

1. A turning space that is longer than i
wide, specifically 63 x 56 inches, is m
workable and desirable.

B. A Corridor width of at least 40 inches
needed for turning 90 degrees into a 32 i
clear opening. Example: Turning from
hallway into a room.

C. A width of at least 5 feet is required for
individuals in wheelchairs to pass each ot

D. Average unilateral vertical reach is 60 inc

E. Average horizontal working (table) reac
30 inches.

F. Average diagonal reach, as would be
quired in using wall-mounted telephones
48 inches from the floor.

IV Functioning of Individuals on Crutches

A. Most individuals require 32 inches betw
crutch tips when walking.

DETAILED INFORMATION

I WALKS

Walks leading to and from buildings or from o
exterior area to another shall conform to the
lowing specifications:

A. Walks shall be at least 5' wide with a *gradie*
no greater than 5% and preferably 3%

B. There shall be a continuing *surface unint*
rupted by abrupt changes in level. This appl
to driveways and other intersections wh
shall blend to a common level with the wa

width of curbing shall be cut away and the walk inclined to the level of the street with a gradient no greater than 1 foot rise in 12 feet. *(See Figure 1)*

B. *Gratings and manholes* shall not be located in pathways leading to curb cuts or at pedestrian crossways.

C. There shall be a level *sidewalk surface* at least 4 feet at the top of the curb cut.

D. All curb cuts must have a *textured surface* to warn blind students they are approaching an intersection.

E. In instances where a curb cut designed in the above manner might present a hazard for pedestrians traveling at right angles, the curb edges can be fanned out to prevent tripping.

GURE 1

a	Curb Cut		c	
dewalk	b		Sidewalk	
	Squared curb edges	4-5 ft.	1 / 12	Street Level
	Smooth transition between ramp and sidewalk; ramp & street		Gradient: 8 per cent	

ENTRANCES

A. There shall be a *minimum of 2 entrances* usable by disabled students. Ground level entrances which can be used by all students are recommended.

B. In deciding the locations of these entrances, the following factors are important:

1. Availability of exits in case of *emergencies.*

2. Proximity of entrances to *parking lots* and the usual *campus pedestrian travel routes.*

RAMPS

C. Flat wheeling *surface between foot curbing* shall be exactly 36 inches.

D. *Handrail* on each side which measures 32 inche above wheeling surface and extends one foo beyond the top and bottom of the ramp. Rail ing shall measure 1 - 1/2 to 2 inches in outside diameter. Allow 2 inch clearance between rail ing and wall.

E. *Surface* of ramp shall be non-slip. Snow melt ing devices or canopy would be very helpful i winter.

F. There shall be a *level platform* at the top of th ramp which is at least 5 feet by 5 feet and ex tends at least 30 inches beyond the latch side of the door and 1 foot beyond the hinged sid of the door. The platform shall be enclosed b railings.

G. There shall be *level platforms* 5 feet in length a 30 foot intervals or whenever the ramp turns

H. Eight feet straight clearance is needed at the *bottom of each ramp.*

I. Care shall be taken to provide an absolutely *smooth transition* between ramp and level su faces. Even a 1/2 inch variation can make pushing uphill very difficult.

J. Ramps shall be *well lighted.*

V DOORWAYS (Interior and Exterior)

A. Interior doorways shall have a *clear opening* of no less than 32 inches after door is installe and be operable by a single effort.

B. Exterior doorways shall have a *clear opening* o at least 36 inches after door is installed.

C. *Pressure required* to open doors shall be 5 lbs whenever possible and shall not exceed 8 lbs Exterior doors are most satisfactory when the are power operated by pressure-sensitive cor tact floor mats.

D. The *floor* on the inside and outside of each doorway shall be level for a distance of 5 from the door in the direction the door swing and extend at least 30 inches beyond the latc side of the door and one foot beyond the

A. Stairs shall have risers with a non-projecting chambered nosing.

B. Risers shall not exceed 6 inches in height.

C. Handrails shall extend 18 inches beyond the top and bottom steps and measure 32 inches above the tread at the face of the riser.

PARKING

A. In all parking areas, ***reserved spaces*** for use by students in wheelchairs shall be provided at locations closest to buildings.

B. Where parallel parking is not feasible, parking bays shall be 12 ***feet wide.***

C. Spaces shall have a ***hard surface and be connected*** to a major walkway by a ramp or level access from each space.

FIRE SAFETY

A. Some provision for the safety of physically disabled individuals shall be made in every building. Since reliability of elevators cannot be assured in case of fire, an area of refuge shall be available on each floor. This area shall be protected by fire walls and be out of the path of main traffic circulation. Some signaling device shall be available so that occupants can let their presence in the area be known to the Department of Public Safety or Fire Department.

B. Fire ***alarm boxes and extinguishers*** shall be located no higher than 48 inches above floor.

C. ***Alarms*** shall carry low and high sound frequencies. In dormitories there shall be a number of rooms for deaf students that are equipped with a large light that will flash when the alarm system is turned on.

FLOORS

A. Floors shall have a non-slip surface.

B. There shall be no difference in the level of the floor on a given story unless various levels are connected by proper ramps.

IDENTIFICATION

A. Doors which might be dangerous for a blind

XI ELEVATORS

A. Minimum inside cab dimensions are 4 feet 9 i
ches deep by 3 feet wide or 4 - 1/2 feet deep b
6 feet wide.

B. ***Doors*** shall be automatic with a sensitive safet
edge and photoelectric cells that cause them t
retract whenever closing is obstructed and sha
have a clear opening of 32 inches, be timed t
remain open for at least 8 seconds and to clos
at a speed of 3 seconds.

C. All ***interior and corridor controls*** shall be cen
tered 42 inches above the floors. Interior con
trols shall be located on side walls and be th
button type. Touch light controls are not sa
tisfactory.

D. A ***corridor key lock*** shall be located no highe
than 42 inches above the floor so that the el
vator can be controlled by keys if it should be
come necessary to restrict its use.

E. A ***two-tone audible up and down*** signal shall b
provided on all corridors for each elevator

XII RESTROOMS

A. Toilet Facilities

1. At least one men's and one women's toile
shall be provided for physically disabled stu
dents on each floor.

2. There shall be at least one ***toilet stall*** in
each restroom that:

a. is at least 3 feet wide.
b. is at least 5 feet deep, preferably 6.
c. is farthest from entrance door.
d. has a door which swings out with a clea
opening of 32 inches.
e. has a wall hung water closet with a nar
row under-structure that recedes sharpl
and has a Sloan flush valve and a disc
operator. The water closet shall be cen
tered at the rear wall with overflow rim
at 16 inches above finished floor.
f. has grab bars on each side, 33 inches high
and parallel to the floor. Rails shall b
1 - 1/4 inches o.d. with 1 - 1/2 inch clea
ance between rail and wall and fastene
securely. Grab bars shall be at least 4

C. Whenever possible the *drains* shall be installed so that the toilet fixtures for the disabled will be at the far end from the riser.

D. Lavatories*

Public lavatories shall be:

1. short apron type, wall mounted, with bottom edge of apron at least 28 inches above floor and a knee-hole opening at least 24 inches wide.

2. Kohler "Jamestown", 18" x 20" or equal, with two 8" c to c drillings, L.H. for Speakman metering faucet and R.H. for Matrous H-801-MJ-VP soap dispenser. Soap dispenser shall be mounted 32 inches above floor.

3. have an open waste and drain, Kohler K-13885 or equal, with 17 ga. P trap mounted parallel to and 1 inch clear of the wall. Waste rough in will be approximately 3 inches to right of center of fixtures. (See Figure 2.)

*Lavatories for residences, see XIX D.

4. have a thermostatic mixing valve to supply lavatory faucets.

5. have an insulated waste line with slip on tubular foam plastic insulation from tail piece to trap.

E. Towel dispensers and disposal units shall be 36 inches from the floor. Towels shall be within reach from lavatory without moving the wheelchair.

F. *Mirrors* shall be mounted with the bottom edge 40 inches from the floor, be tilted or full length

G. ***All heights shall be noted on mechanical plans.***

TELEPHONES

A. At least one *public* and one *campus* phone shall be usable by physically disabled students on each floor. Conventional phone booths are not

C. Height of *cable outlet* shall be shown on electrical drawings. Conduit will terminate on wall at 38 - 1/2 inches above floor for public phones and 43 - 1/2 inches above floor for campus phones.

D. Contractor shall submit *shop drawings* of the phone stations showing above features for approval by ERS. No subsequent changes shall be made by phone company without approval of ERS.

XIV WATER FOUNTAINS

A. At least one water fountain usable by physically disabled students shall be centrally located on each floor. The specifications below are satisfactory for both wheelchair and able bodied students.

B. Water fountains shall be *hand operated* with up-front spouts and controls. Fountain shall be mounted with the upper edge of the fountain basin 36 inches from the floor and bubbler set to discharge parallel to wall.

C. Water fountains shall be ELKAY Model EDF 10 with 6 inch skirt, push button controls and remote electric cooling or equal.

D. If it is necessary to set fountain in an alcove the width of the recess shall be at least 3 feet

XV CLASSROOMS, AUDITORIUMS, AND LABORATORIES

A. Where stationary chairs are used, several *chair spaces* shall be left vacant or supplied with easily movable chairs so that wheelchair students will have a level seating area. Adequate turning space into seating area is essential.

B. In large classrooms and auditoriums, wheelchair students shall have access to a *seating area* somewhere other than the back row. There shall be no step between seating space and the aisle.

C. In theatres and auditoriums there shall be a level or ramped access to the *stage.*

D. *Laboratory* rooms shall contain at least one working unit for students in wheelchairs.

cessed aprons and drawers and some braces will block a wheelchair.

3. Corridors between counter rows must be at least 48 inches wide to allow a wheelchair to turn into counter kneehole space.

4. Faucets and other lab equipment shall be mounted within reach from a sitting position.

I LIBRARIES AND BOOKSTORES

A. Aisles between stacks shall be at least 4 feet wide.

B. Turnstiles shall not be used unless alternate provisions are made for wheelchairs.

I CAFETERIAS

A. *Food lanes* shall be at least 34 inches wide, measuring from the traffic control railing to the outer edge of the tray counter.

B. *Tray counter* shall be 34 inches from floor. There shall be no breaks in the counter from point of entry to cashier which would necessitate lifting the tray off the tray counter.

C. Self service *water faucets* shall be hand operated and have a counter surface so glasses can remain on counter while being filled.

D. All self service features shall be usable from a wheelchair.

E. *Dining tables* shall measure at least 30 inches preferably 31 inches from the underside to the floor. Tables with hold aprons are not usable by wheelchair students. Care shall be taken that braces and supports are placed so they do not block wheelchairs.

F. Aisles between tables shall be 5 feet wide.

I RECREATIONAL AND PHYSICAL EDUCATION AREAS

A. Students in wheelchairs can participate in sports such as swimming, archery, bowling, basketball, and table tennis. They will also be spectators at all sports events. Therefore, access to all gym areas and seating areas in all

passages from these facilities to all recreational areas which they serve.

D. An adequate number of *lockers* shall be accessible to wheelchairs. They shall have hooks and shelves at low heights with at least 3 feet between the front of lockers and bench. A minimum aisle, 5 feet wide, is needed between bench rows when wheelchair lockers are opposite one another.

E. At least one men's and women's *shower* in each locker room shall be usable by disabled individuals. (See shower specifications, XIX C.)

F. *Hair dryers* shall be mounted 5 - 1/2 feet above the floor and shall have a clear opening below. The dryers shall have controls no higher than 42 inches above floor and have a provision for adjusting the direction of heat flow.

XIX DORMITORIES* AND RESIDENCES

A. *Rooms* with features for disabled students shall be provided in various locations so that disabled students will be intermingled with non-disabled students and not confined to one floor or section of the dormitory. Adequate provision for *fire precautions* shall be considered when planning locations of rooms. (See Section VIII.)

B. Bedrooms

1. It is imperative to have adequate *wheelchair travel space* throughout the room. As a general guide, there shall be 5 feet between the side of the bed and a desk, dresser or other bed; 40 inches between the side of the bed and wall surface and 4 feet between the foot of the bed and any wall surface. Beds placed against a wall must be easily movable, and have wheel locks. There shall be room for a bedside table next to each bed.

2. Closets shall have rods which are 48 inches above floor. There shall be a continuous level surface between floor of closet and floor of room with no barriers on the floor to prevent wheelchair from entering closet area. Closet doors that slide shall have the riding rail beneath the surface of the floor. Closet doorway width can be 25 inches because wheelchairs need only partial entry.

electric outlet shall be provided at counter height above each lavatory and next to mirror.

7. *Heat and ventilation controls,* including window handles, must be within reach from a wheelchair and have individual manual controls. Radiators shall be recessed in wall whenever possible. If they protrude from wall they must be located so that they do not block access to adjacent areas.
8. Desk type *telephones* in rooms shall be placed next to beds. For wall type corridor phones see Section XIII.

9. *Intercom speakers* shall be centered 40 inches from floor.

Showers

1. Cubicles designed in the following manner can be used by all students. They shall be planned so that the seat described below can be mounted on the left wall in half of the cubicles and on the right wall in the other half. The floor outside the cubicles must extend at least 2 feet beyond the side on which the seat is mounted.

2. The shower cubicles shall measure 3 feet wide by 3 feet deep and have a threshold no higher than 2 inches. The soap dish shall be recessed. The floor inside and outside the cubicles shall have a non-slip surface. There shall be a clear area at least 5 x 5 feet outside the cubicle.

3. An "L" shaped grab bar shall be mounted 31 inches above floor and extend across wall opposite seat and along back wall. Rails shall have a rough peened surface, be 1 - 1/4 inches o.d. with 1 - 1/2 inch clearance between rail and wall and fastened securely. Grab bars must be constructed to withstand forces of 400 lbs.

4. Shower mechanism shall include Powers Type 425 Hydroguard thermostatic mixing valve with No. 22 stop check valves; 2 Kohler K7385 "industrial" swivel shower heads with insert type volume control, Powers 141-161 Nylon hand held shower and bracket and 3 Powers diverters, type 33 volume and shut off control. Mount the outlet for

5. A folding shower seat shall be constructed according to plans available from ERS.

6. Contractor shall submit shop drawings of installations for approval by ERS.

D. Lavatories

1. Dormitory lavatories shall be the same as public lavatories under Section XII D., with the following exceptions:
   a. Lavatories shall have Delta No. 510 mixing faucets with stopper and chain, but with drain and waste Kohler K-13881 with trap mounted as for public toilet rooms. Note that a flexible supply for the off-set cold water supply will be needed to clear the offset drain location.

   b. Lavatories shall be mounted with bottom of apron 30 inches from floor the top edge shall be no higher than 32 inches above floor. There shall be a kneehole space at least 28 inches wide.

   c. If lavatory is mounted in a counter, it shall be set as close to the front edge as possible.

   d. There shall be storage space provided for medicine chest items below counter level with a toe space of at least 8 inches.

   e. Mirrors shall be mounted over lavatories with the bottom edge as low as possible and no higher than 36 inches.

   f. Towel rods shall be no higher than 46 inches, preferably 40 inches above floor.

E. Toilets

1. It is essential that enough toilets be designed for wheelchair students so that they will always be assured of ready access. Wheelchair students use bathrooms for longer periods than other students.

2. See Section XII A. 2.

F. Laundry

mended. If these cannot be used, there shall be a clear space underneath the board, measuring 30 inches from the underside to the floor.

Furniture

1. The bed shall have an extra firm mattress. The top shall be at least 22 inches above the floor. If beds are the type with drawers under the spring, a toe space of at least 8 inches will prevent damage by wheelchair footplates.

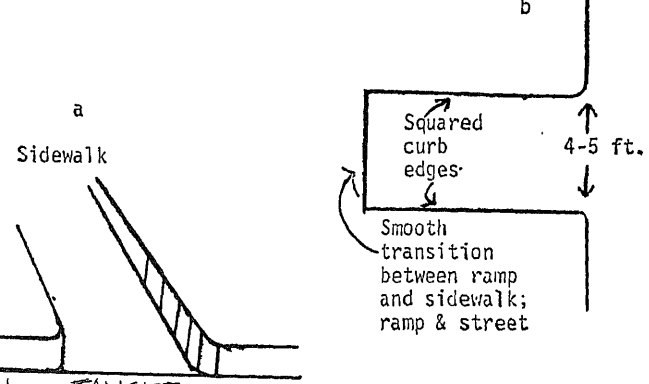
2. Desks shall measure 30 inches from the underside with a working surface no higher than 31 inches. There shall be a clear kneehole space at least 26 inches wide and preferably 28.

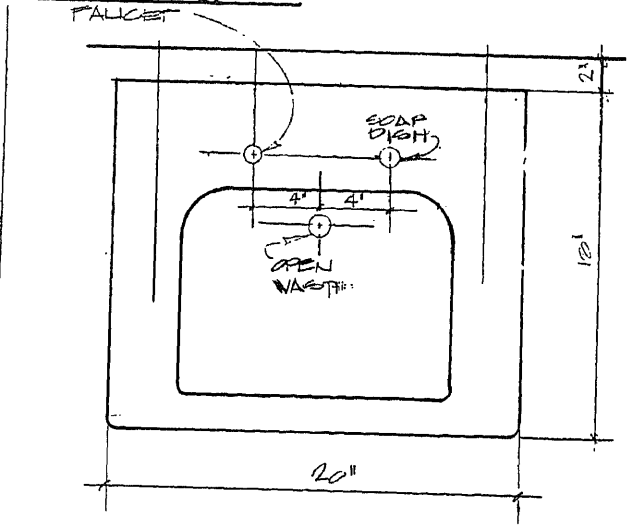
3. There shall be a provision for ***bookshelves*** which are within reach from a wheelchair.

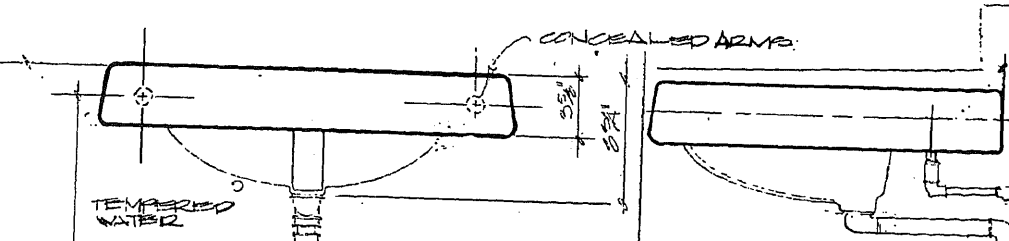
4. ***Dressers*** shall be the type that have low drawers. Drawers shall not be so long that they are difficult to operate from a wheelchair.

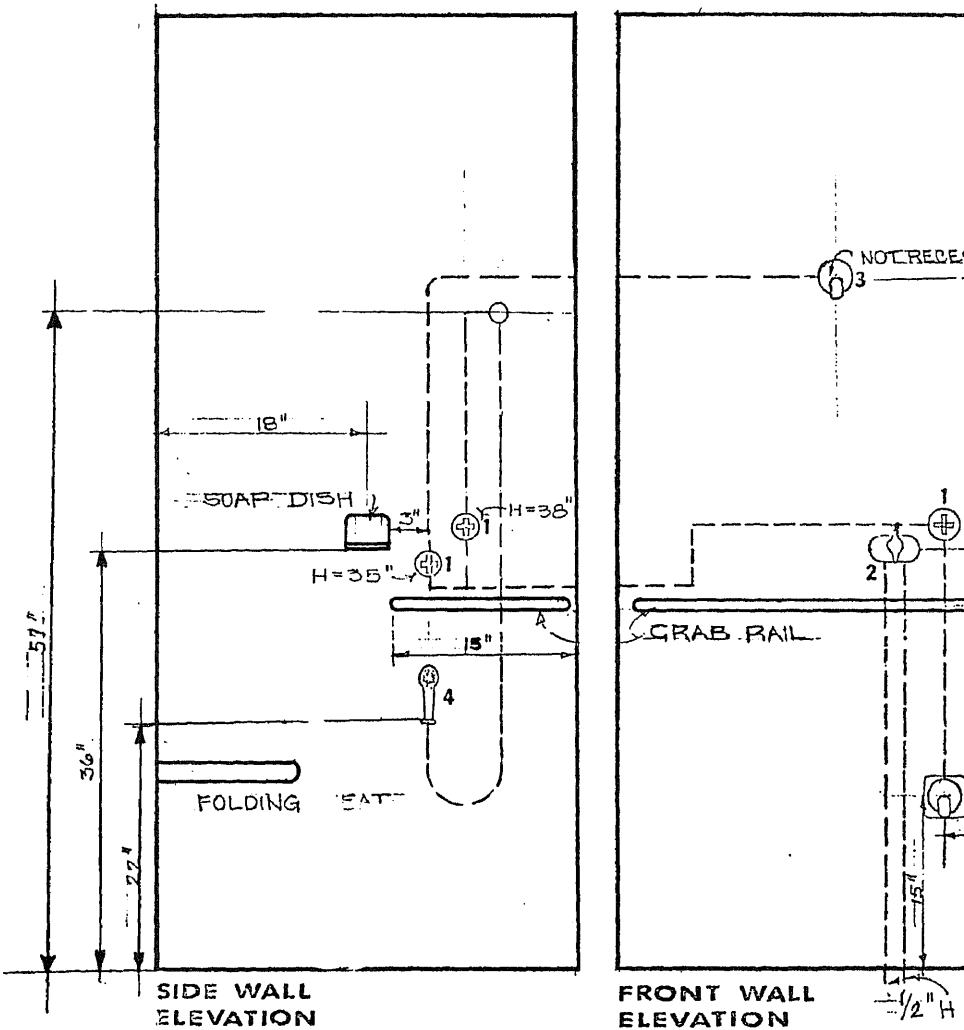
5. A ***refrigerator*** on each floor should be provided for students needing medication, such as diabetics.

6. ***Furniture legs*** which angle out should be avoided.


a
Sidewalk
b
Squared curb edges
4-5 ft.
Smooth transition between ramp and sidewalk; ramp & street
c
Sidewalk
1
12
Str
Lev
Gradient:
8 per


FAUCET
SOAP DISH
4"
4"
OPEN WASTE
2½"
18"
20"


CONCEALED ARMS
5½"
8½"
TEMPERED WATER



1—POWERS TYPE 33 VOLUME & SHUTOFF CONTROL

2—POWERS TYPE 425 THERMOSTATIC MIXER & CHECKS

3—RECESSED KOHLER K-7385 "INDUSTRIA" SWIVEL
HEAD WITH INSERT TYPE VOLUME CONTROL.

THE AMERICAN INSTITUTE OF ARCHITECTS

National Policy

for

A Barrier - Free Environment

In the United States today it is estimated that one out of ten persons has limited mobility due to a temporary or a permanent physical handicap. Improved medical techniques and an expanding population of older persons is increasing this number every year. Yet in general, the physical environment of our Nation's communities continues to be designed to accommodate the able-bodied; thereby, increasing the isolation and dependence of disabled persons. To break this pattern requires a national commitment.

Therefore, it shall be national policy to recognize the inherent right of all citizens, regardless of their physical disability, to the full development of their economic, social and personal potential, through the free use of the man-made environment.

The adoption and implementation of this policy requires the mobilization of the resources of the private and public sectors to integrate handicapped people into their communities.

A. Establish a national commission to spearhead a coordinated national program for elimination of environmental barriers.

Objectives

- Provide a focal point for existing barrier-free programs, and initiate, encourage, and coordinate new projects
- Obtain endorsements of the national policy statement by public, private, professional and voluntary agencies
- Develop a Plan of Action to implement the national policy and direct and assist endorsing organizations to carry it to fulfillment
- Secure funding to sustain and support itself

Organization

- Membership in the commission would be primarily by organizational subscription
- Governance by Board of Directors, perhaps with rotating chairmanship, with broad operating powers delegated to small Executive Committee working with and through Executive Director
- Staffing: Executive Director, professional and clerical staff employed by the commission itself
- Financing: Subscription dues would provide major portion; possibility of foundation grants, federal grants, for specific research projects or similar tasks
- Existing local, state and national organizations would provide basic foundation upon which commission would build as necessary for a coherent, coordinated national effort

1 - Establish a national information clearinghouse to provide a centralized system for collection and retrieval of data related to social and environmental barriers for the handicapped

2 - Monitor the activities of the Federal Architectural and Transportation Barrier Compliance Board

   a) provide information to the Board including violations of the Architectural Barriers Act of 1968

   b) provide professional guidance and expert assistance to the Board

3 - Work for the manufacture of new, and the conversion of existing, transportation systems which are fully accessible to handicapped people

   a) Federal Law: to require rail, air, bus, common carriers to provide full accessibility to handicapped including terminal areas under their control

   b) State Law and Regulation: to require intrastate motorbus carriers and mass transit operators to provide full accessibility; also airport terminals, parking areas, parking lots, and city streets

4 - Support legislation which promotes and advances a barrier-free environment

   a) develop model federal, state and local laws and codes including enforcement provisions

   b) Rate existing laws against the model to pinpoint inadequacies

   c) Develop action program to strengthen existing laws and pass new ones

   d) Implement action program by enlisting support of other groups

   e) Monitor the results of the program and the enforcement of the laws, with provision for review and revision of strategy as needed

   f) Require appropriate education of enforcement officers, including training

5 - Promote improved design standards

a) Activate American National Standards Institute review procedures

b) Establish a systematic review and revision procedure for such standards that includes consumer reaction and approval

c) Pursue program to make barrier-free standards part of registrati examinations for architects and interior designers

6 - Encourage research and development programs and demonstration proje

a) conduct an inventory of existing research findings

b) sponsor behavioral studies of different types of disabilities as well as variations in physical needs of different disabilities

c) develop mechanisms and accessories to make environments adaptabl for persons with different requirements

d) work toward ongoing research in areas of housing, transportation

7 - Initiate a campaign for greater public awareness of the needs and problems of handicapped people

a) Urge the business community to make all retail stores and workpl accessible to handicapped people and enlist their support in bri about local building code and zoning law changes to that end

b) Publicize widely the movement for a barrier-free nation through communications media

c) Develop social studies modules on handicaps for primary and seco schools

d) Develop courses on handicaps for hotel and motel management trai

e) Work through Council of State Governments, League of Cities, etc sponsor barrier-free conferences or projects

8 - Improve professional education of designers in relation to the needs and capabilities of the handicapped and aged

a) Curriculum reform should be promoted for design professions

b) Educational aids (i.e., films, handbooks on barrier-free standards) should be developed for use in schools

c) Develop action programs to be carried out by student groups, including using students as interns on "national commission" staff for college credit

d) Reach those pace-setting architects who influence professional opinions

e) Develop follow-up programs and techniques to keep architects and other design professionals aware of latest standards in barrier-free design

f) Encourage interdisciplinary conferences on implementation of barrier-free design standards

BARRIER-FREE DESIGN

ACCESSIBILITY FOR THE HANDICAPPED

PHYLLIS L. TICA
JULIUS A. SHAW



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in cooperation with

THE DIVISION OF OCCUPATIONAL EDUCATION SUPERVISION
and
THE BUREAU OF TWO YEAR COLLEGE PROGRAMS

THE NEW YORK STATE EDUCATION DEPARTMENT
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Jack A. Schneps, Project Directo

ACKNOWLEDGEMENTS

We would like to take this opportunity to compliment the dedicated groups throughout the country who work so deligently to transform accessibility information into legislation, and hope that their success will encourage legislators in other areas to create a barrier-free environment so that handicapped people may enjoy a more reasonable freedom choice.

A very special note of appreciation to James Mazzaferro, Assistant Administrator of the New York City Transportation Administration, without whose assistance, cooperation and understanding this document would not exist; to Administrator Michael J. Lazar, Transportation Administration; Administrator, John T. Carroll, Municipal Service Administration; and to Commissioner Herbert J. Simins, of the Department of Public Works, for his cooperation and early commitment to have many of the recommendations included in contracts let by that department; to the Committee to Advance the Goals of Higher Education for the Disabled at City University for its invaluable assistance; and to Paul Chakonas, Associate, Bureau of Two Year College, S.E.D. for his sincere and active support.

Phyllis L. Tica
Julius A. Shaw

FORWARD

This document has been compiled so that policy makers, administrators, architects, engineers, and contractors have a convenient source of information to enable them to design and build a barrier-free environment in which the mobility of physically handicapped persons is not inhibited by external forces.

It is comprised of the accessibility aspects of the existing New York City Building Code and additional recommendations gathered from national and international sources and, most importantly, from first hand experiments with the handicapped community.

Permission was given for a pre publication draft of this material to be distributed to participants at the Statewide conference, Responding to needs of the Handicapped: Two Year College Strategies Workshop. The expansion and subsequent distribution of this document is one of a number of ongoing efforts of IRDOE to assist institutions in their efforts to reach and prepare individuals for gainful occupation consistent with their capacities and abilities.

Jack A. Schneps
Project Director,
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Workshop/Conference

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Accessibility For The Handicapped

Listed are the relative provisions mandated by the existing Building Code, followed by recommendations which are felt should be required and/or listed as preferred when possible.

* Recommend to be mandated

** Recommend as referred

I. Alterations
Building Code C26 103.0 - 103.5

Sub-Article 103.0 ALTERATION OF EXISTING BUILDINGS Subject to the provisions of section 100.5, and except as otherwise specifically provided by the provisions of this code, the following provisions shall apply to the alteration of existing buildings, whether made voluntarily or as a result of damage, deterioration, or other cause.

C26-103.1 Alterations exceeding 60 percent of building value. If the cost of making alterations in any 12 month period shall exceed 60 percent of the value of the building, the entire building shall be made to comply with the requirements of this code.

C26-103.2 Alterations between 30 percent-60 percent of building value. If the cost of making alterations in any 12-month period shall be between 30 percent and 60 percent of the value of the building, only those portions of the building altered shall be made to comply with the requirements of this code.

C26-103.3 Alterations under 30 percent of building value or of a converted dwelling. If the cost of making alterations in any 12-month period shall be under 30 percent of the value of the building, or if the building is a converted dwelling, those portions of the building altered may, at the option of the owner, be altered in accordance with the requirement of this code, or altered in compliance with their previously required condition and with the same or equivalent materials and equipment, provided the general safety and public welfare are not thereby endangered.

C26-103.4 Alteration involving change in occupancy group or use. If the alteration of a building or space therein results in a change in the occupancy group, classification of the building under the provisions of article 3, then the entire building shall be made to comply with the requirements of this code. If the alteration of a space in a building involves a change in the occupancy of use thereof, alteration work involved in the change shall be made to comply with the requirements of this code and the remaining portion or the building shall be altered to such extent as may be necessary to protect the safety and welfare of the occupants.

C26-103.5 Alteration cost: building value. For the purpose of applying the foregoing provisions of this subarticle, the cost of making alterations shall be determined by adding the estimated cost of making the proposed alterations computed as of the time of submitting the permit application, to the actual cost of any and all alterations made in the proceding 12-month period; and the value of the building shall be determined at the option of the applicant on the basis of 1.25 times the current assessed valuation of the building, as adjusted by the current State equalization rate, or on the basis of the current replacement cost of the building, provided that satisfactory evidence of current replacement cost is submitted to the commissioner.

C26-103.6 Alterations to multiple dwelling and conversions to multiple dwellings. At the option of the owner, regardless of the cost of the alteration or conversion, an alteration may be made to a multiple dwelling or a building may be converted to a multiple dwelling in accordance with all requirements of this code or in accordance with all applicable laws in existence prior to December 6, 1968, provided the general safety and public welfare are not thereby endangered.

II Exits

C26-600.1 Scope. The provisions of this article shall control the design, construction, protection, location, arrangement and maintenance of required exit facilities to provide safe means of egress from all building hereafter erected, altered or changed in occupancy; except that exit

C26-600.2 Definitions. For definitions to be used in the interpretation of this article, see article 2.

C26-600.3 Inadequate exists for existing structure. Every structure existing on the effective date of this code which is not provided with exist facilities as prescribed in this code, and in which the exit facilities are, in the opinion of the commissioner, inadequate for the safety of the occupants, shall be provided with such means of egress or fire protection as the commissioner shall direct.

SUB-ARTICLE 601.0 DETERMINATION OF EXIT REQUIREMENTS

C26-601.1 Exit requirements. The determination of exit requirements for a building shall be based upon the Occupancy Group classification of the building, the number of occupants, the floor area, the travel distance to an exit, and the capacity of the exits, as provided in Table 6-1 and herein. Every floor of a building shall be provided with exit facilities for its occupant load. The occupant loads of floors shall not be cumulative for the purpose of designing vertical exists, except where one floor is used by another as a means of egress. Vertical exits provided from any floor above grade may serve simultaneously all floors above grade, and vertical exits provided from any floor below grade may serve simultaneously all floors below grade.

(a) Mixed occupancy. When a building is classified in more than one occupancy group in accordance with the provisions of section C26-301.3, the exit requirements for the entire building shall be determined on the basis of the occupancy group having the strictest exit requirements. or the exit requirements for each building section shall be determined separately.

(b) Incidental occupancies. When a building contains incidental occupancies classified in occupancy groups other than that under which the building is classified, the exit requirements for the floor on which such occupancies occur shall be based upon those of the occupancy group under which the building is classified; but the access and exit

determining the exit requirements.

(d) Building access. All buildings classified in other than occupancy groups A, B-1, or B-2 open structures of D-2, or J-3, shall have at least one primary entrance accessible to and usable by individuals in wheelchairs. Such entrance shall provide access to a level that makes elevators available in buildings where elevators are provided. Where ramps are used to comply with this requirement, they shall have a slope not greater than 1 in 12, and shall otherwise conform to the provisions of section C26-604.10.

III Doors
Building Code C26 604.4

C26-604.4 (e) Door Opening Widths. The capacity of exit and corridor openings shall be as listed in Table 601. Door jambs or stops and the door thickness when open shall not reduce the required width by more than 3 in. for each 22 in. of width. The maximum width of any swinging door leaf shall be 48 in. The minimum nominal width of corridor and exit door openings shall be 36 in. except that where a door opening is divided by mullions into two or more door openings, the minimum nominal width of each such opening shall be 32 in. (see door recommendation C). The minimum nominal width of other door openings shall be as follows:

(1) Door openings to all habitable and occupiable rooms - 32 in. (see recommendation Door 'a').

(2) Door swinging in pairs (no mullion), opening 48 in.

(3) Door opening to rooms used by bedridden patients and all single door openings used by patients in buildings classified occupancy group H-2 - 44 in.

(4) Door openings to toilet rooms in building to which the public has free access shall be 32 in. (see recommendation, Door'a').

(5) Door openings giving access to at least one toilet, lavatory and bathtub or shower in each dwelling unit, in buildings or spaces classified group J-1 or J-2, when such dwelling unit is accessible to individuals in

wheelchairs - 32 in.

(6) Door openings giving access to all toilets, lavatories and bathtubs or showers serving single room occupancies which are accesiable to individuals in wheelchairs - 32 in.

(f) Door heights. The minimum nominal door opening height for exit and corridor doors shall be 6 ft. 8 in. Door jambs, stops, sills, and closets shall not reduce the clear opening to less than 6 ft. 6 in. (See Illustration 2A).

(g) Door swing. Exit doors, corridor doors from rooms or spaces classified in high hazard occupancy group A, and corridor doors from rooms required to have more than one door under the provisions of section 603.1, shall swing in the direction of exit travel. (See Illustration 2H).

Except:

(1) Exterior street floor exit doors, other than those from interior stairs from buildings classified in occupancy groups J-2 and J-3

(2) Doors from rooms of instruction in buildings classified in occupancy group G having an occupant load of less than 75 persons

(h) Floor level. The floor on both sides of all exit and corridor doors shall be essentially level and at the same elevation for a distance, perpendicular to the door opening, at least equal to the width of the door leaf, except that where doors lead out of a building the floor level inside may be 7 1/2 in. higher than the level outside. (See recommendation, Door 'g')

(i) Closed doors. Exit doors and corridor doors shall normally be kept in the closed position, except that corridor doors in buildings classified in occupancy group H-2 shall be exempt from this requirement.

Recommendations

**a 604.4 (e-1 and e-4) presently require 32 in. door widths. This should be corrected

*c 604.4 (e) presently requires that where a door opening is divided by mullions into two or more door openings the minimum nominal width of each such opening be 32 in. This should be increased to 34" or doors hinged to allow 32" of clear space. (See Illustration 2B-C).

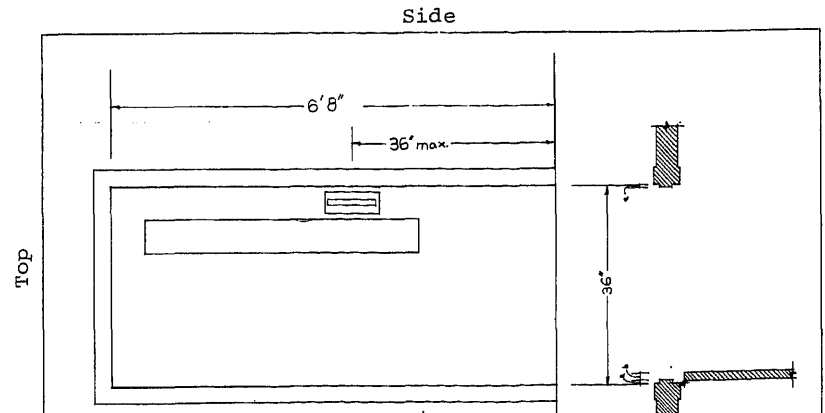
*d All doorsills must be bevelled edges which merge to a common level with the floor on either side. Doorsills should be eliminated wherever possible. (See Illustration 2D).

**e Protruding door handles preferred on sliding doors.

*f Doors not intended for normal use should have knurled hardware to signify danger to blind and partially sighted persons. (See Illustration 2F).

*g 604.4 (h) allows for a 7 1/2 in. change in floor level at an entrance/exit door opening. This should not be permitted as it precludes accessibility for the wheelchair bound.

*h Power operated self opening doors are preferred whenever possible (electric eye or other).



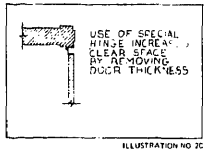


ILLUSTRATION NO 2C

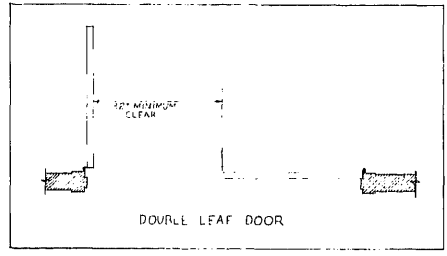


ILLUSTRATION NO 2B

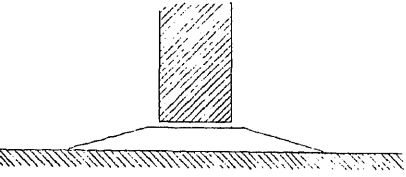


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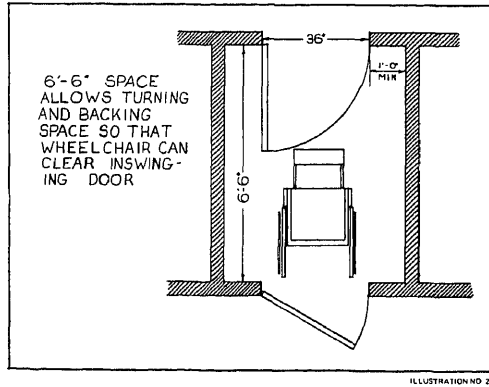


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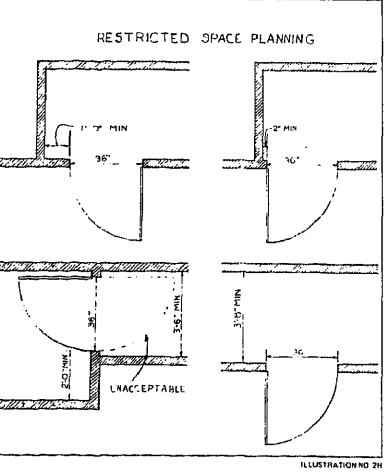


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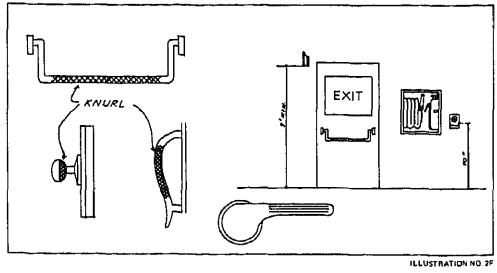


ILLUSTRATION NO 2F

C26-407.2 When a building erected prior to December 6, 1969 is altered to provide access to individuals in wheelchairs ramps constructed to provide such access may, with the approval of the commissioner, project beyond the street line for a distance of more than 44 in.

C26-604.10 Ramps. Interior or exterior ramps may be used as exits in lieu of interior or exterior stairs provided they comply with the applicable requirements for interior stairs in section C26-604.8 or exterior stairs in section C26-604.9 respectively, and with the following.

(a) Capacity. The capacity of ramps shall be as listed in Table 6-1.

(b) Maximum Grade. Ramps shall not have a slope steeper than 1 in 8, except that in buildings classified in occupancy group H the slope shall exceed 1 in 12, and except as provided in article 8 for places of assembly.

(c) Design

(1) CHANGES IN DIRECTION. Ramps shall be straight, with changes in direction being made at level platforms or landings, except that ramps having a slope not greater than 1 in 12 at any place may be curved. (See recommendation Ramps d)

(2) LENGTH. The sloping portion of ramps shall be at least 3 ft. but not more than 30 ft. long between level platforms or landings.

(3) PLATFORMS. Level platforms or landings, at least as wide as the ramp, shall be provided at the bottom, at intermediate levels where required, and at the top of all ramps. Level platforms shall be provided on each side of door openings into or from ramps, having a minimum length in the

direction of exit travel of 3 ft. and when a door swings on the platform or landing a minimum length of 5 ft. (see recommendation Ramps d, e, f)

(4) DOORS. Door opening into or from ramps shall comply with the requirements for stairs in section C26-604.8 (g). No door shall swing over the sloping portion of a ramp.

(5) GUARDS AND RAILINGS. Guard and railings of ramps shall comply with the applicable requirements of section C26-604.8(f) except that only ramps having a slope steeper than 1 in 12 need comply with the requirements for handrails, and intermediate handrails shall not be required. (See recommendation Ramps 'a').

(6) SURFACE. Interior ramps exceeding a slope of 1 in 10 and all exterior ramps shall be provided with nonslip surfaces.

Recommendations

*a Handrails 32 in. high, intermediate rails 22 in. high on both sides of free standing ramp. If ramp runs adjacent to wall, handrail and intermediate rail required on one side only. Rails to extend 18 in. beyond top and bottom of ramp unless this would present a safety hazard. (See illustration 3A & 3B.)

**b Ramp width to be a minimum of 36 in. or usable space, preferable 48 in. in new construction. (See illustration 3A - 3B -3C.)

In renovation a minimum of 36 in. where there is an insufficient allowable space.

*c All open edged ramps are required to have safety guards of at least 2 in. in height and 2 in. in width.

*d Level platforms at no more than 30 feet intervals (rather than intermediate levels) for ramps. (See illustration 3C.)

*e Level platforms at exterior door openings shall extend at least 1 foot beyond each side of the doorway. (See illustration 3C.)

**f Level platforms at exterior door opening should be a minimum of 6 ft. in depth when door swings on platform (5 ft. required in 604.10 (C3) is not adequate). (See illustration 3C.)

*g Minimum of 6 ft. of level clearance at bottom of ramp (no obstructions). (See illustration 3C.)

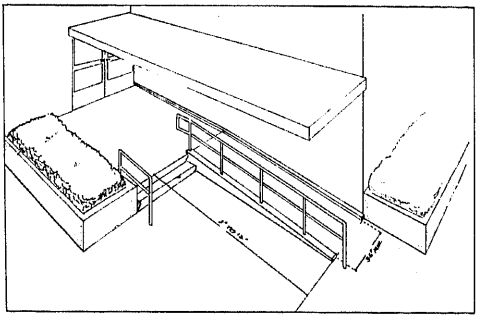
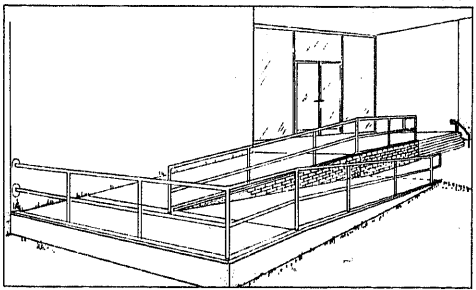
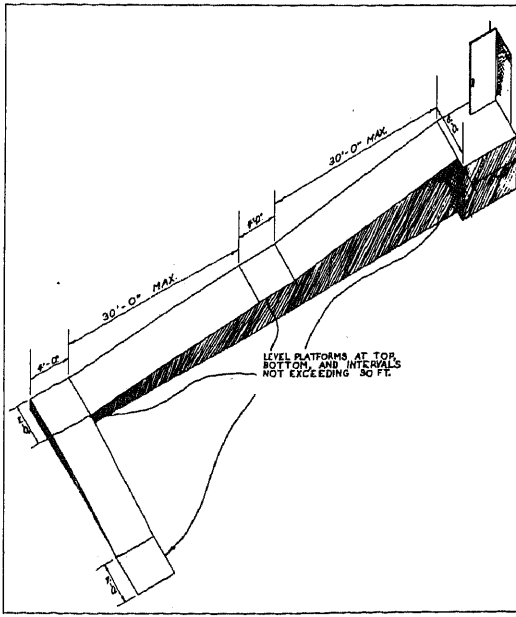


Illustration No. 3A





h. Performance viewing positions shall be provided for wheelchair persons in accordance with the following schedule. These positions shall be located so as not to interfere with egress from any row of seats and shall be reachable by means of ramps and/or elevators. Steps shall not be allowed in the line of travel from the main approach entry to the designated locations.

Capacity of Assembly Space	Number of Viewing Positions
75 to 500	Minimum 2
501 to 1000	Minimum 3
1001 to 1500	Minimum 4

Over 1500-minimum 4 plus 1 for each 400 over 1500
(See recommendations a&b)

Recommendations

*a Greater number of viewing positions can readily be provided by the simple expedient of providing movable chairs which can be placed in these positions and sold to general public, giving management great flexibility. (See Illustration 4A-4B.)

**b Increase seating capacity as follows:

Capacity of Assembly Space	Number of Viewing Positions
to 500	Minimum 4
501 to 1000	Minimum 12
1001 to 1500	Minimum 16

Over 1500 minimum 16 plus 1 for each 1500 over 1500

*c. Cafeterias and dining areas shall be designed to allow passage of a wheelchair through the food service lanes and between tables. (See Illustration 4C - 4D)

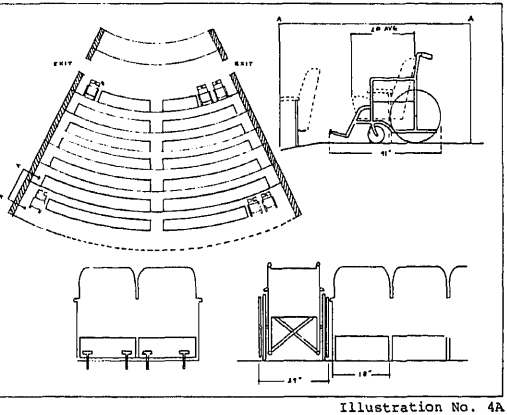
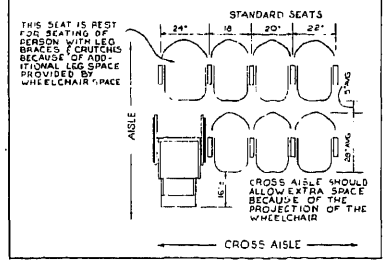


Illustration No. 4A



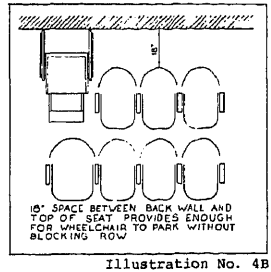


Illustration No. 4B

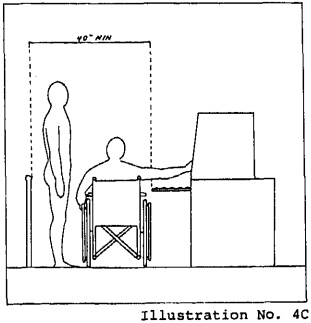


Illustration No. 4C

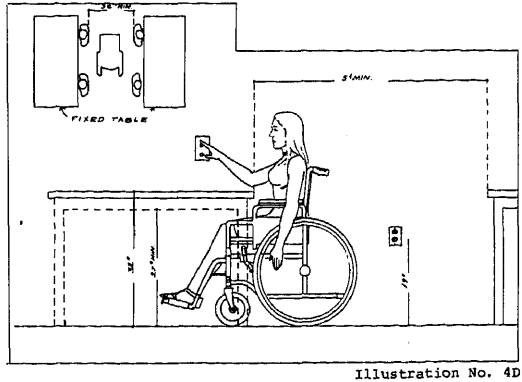


Illustration No. 4D

VI Bathrooms

Building Code P104.1 REQUIREMENTS 104.1 & 104.9

(a) Minimum number of fixtures. - The number of plumbing fixtures required for an occupancy shall be as listed in table RS 16-5. The requirements for an occupancy not listed in the table shall be subject to approval by the commissioner.

(b) Facilities for each sex. - Where public toilet or bathing facilities are designed for use by more than one person at a time, separate facilities shall be installed for each sex.

(c) Facilities for physically handicapped.

In every building where public toilet facilities are provided there shall be least one water closet stall which is accessible to the physically handicapped, at least 3 ft. wide by 5 ft. in depth having a door (if used) that is 32 in. wide and swings out to accommodate a wheelchair. The water closet seat in this one stall shall be set 20 in. above the floor. The stall shall be provided with grab bars on each side, the grab bars shall have an outside diameter of 1 1/2 in., and shall be 33 in. above and parrellel to the floor, with 1 1/2 in. clearance from the wall. One drinking fountain facility, not of the recessed type, set 30 in. above the floor, shall be provided. (See bathroom recommendation (h-1).) (See illustration 5 E & 5 F.)

(d) Accessibility. The fixtures specified in table RS 16-5 for public buildings shall be located not more than one floor above nor more than one floor below the floor occupied by the people for whose use the fixtures are intended, unless elevator service is available except that in buildings classified in occupancy group E which are accessible to the physically handicapped, there shall be at least one such toilet stall for male and one for female use for every 300 occupants of each sex in the building.

Recommendations

**a Preference is wall mounted water closet with narrow understructure. (See illustration 5A).

*b. Exposed drain and hot water pipes under sinks shall be insulated to prevent the occurrence of burns for those persons having a lack of sensation in their limbs. (See Illustration 5B.)

*c. Bathroom sink should be mounted to allow for a minimum of 27 in. clearance in height from the floor, and should not be more than 20 in. in depth from wall.

*d. At least one each of bathroom amenities, such as paper towels, shelves, dispensing machines, lower edge of mirrors shall be mounted, no more than 40 in. from the floor, excepting toilet paper which should be within arms reach when seated. (See Illustration 5B).

*e. If urinals are mounted above floor height, at least one should be no higher than 15 in. above floor level, with grab-bar on at least one side of the urinal for persons using crutches. (See Illustration 5C.)

*f. All public restrooms shall be identified as to sex distinction by raised or indentented block lettering at 2 in. to 3 in. in size placed on the door and/or on right door frame, at a height of approximately 5 feet.

*g. Where double entrance doors are used in a bathroom, the inner door must be multi-directional free swinging single or double doors or a free area of six feet between doors must be provided. (See Illustration 2G).

*h. There should be at least a minimum of one stall 6 feet wide x 5 feet deep. (see Illus. 5D)

**i. Grab bars mandated in code, are satisfactory for 3 ft. wide stall, however, in the 6 ft. wide stall grab bars should be placed to form an "L" shape on walls adjacent to toilet seat. (See Illustration 5D.)

**j. 32 in. stall doors opening outward are mandated. Preference would be 36 in. door.

**k. The water closet seat should be set 18 in. above the floor rather than the 20 in. recommended in the code about 1 ft. from the adjacent wall measure to the edge of seat.

**l. Two stalls when possible, toilet bowl to be mounted on one stall on right and in the other on the left; doors to be placed diagonally opposite from bowls.

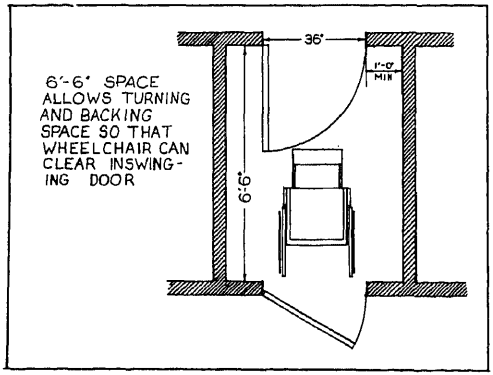


ILLUSTRATION NO. 26

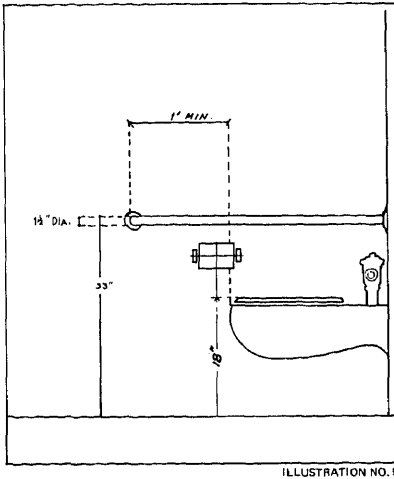
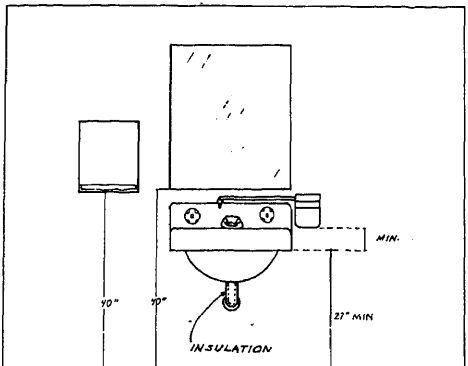
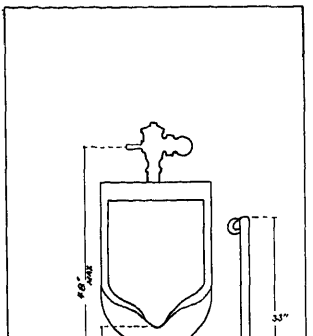
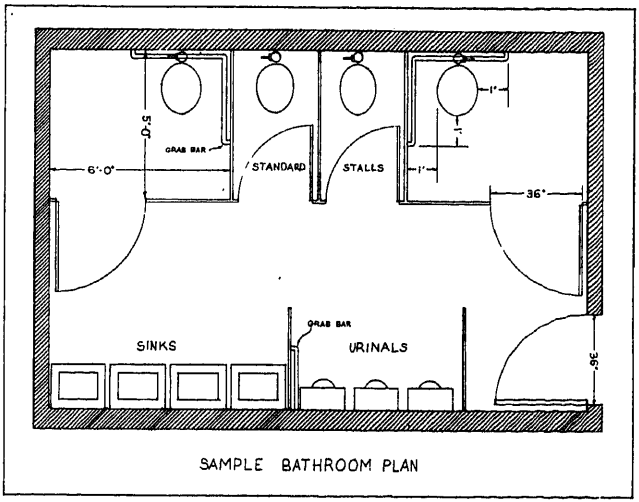


ILLUSTRATION NO.







SAMPLE BATHROOM PLAN

Illustration No. 5D

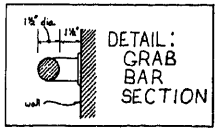
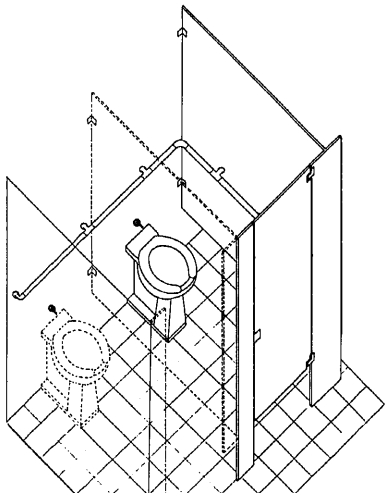


Illustration No. 5E



RENOVATION OF EXISTING SERIES OF STANDARD BATHROOM STALLS

1. Remove dividing panel
2. Remove one water seat
3. Permanently close or replace with panel, door opposite remaining seat.
4. Enlarge doorway opposite removed water seat
5. Install curtain or single 36 inch door opening outward (Lever type handle if possible)

Recommendations

*a. At least one shower stall for each sex should be accessible and measure 36 in. wide x 48 in. deep.

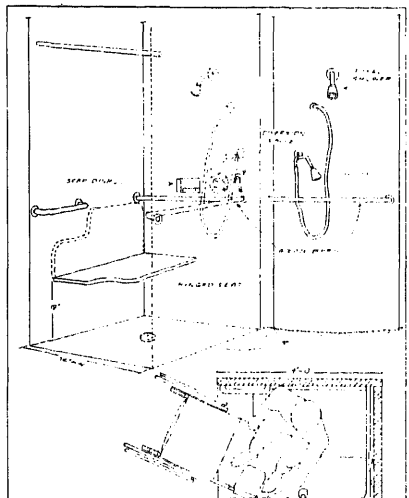
*b. A hinged seat, 19 in. high, situated opposite the shower spray. Seat should be 36 in. to 42 in. in length recessed 6 in. to 12 in. from entrance and have non slip surface.

*c. Two wall length grab bars; one on wall opposite entrance. Garbar or handle 1 ft. long at entrance on wall accommodating hinged seat.

*d. Controls on wall opposite entrance near seat side (within easy reach).

*e. Secondary flexible shower spray adjacent to controls.

*f. If there is a raised sill at entrance to prevent runoff, sill must be bevelled to blend to a common level with the floor on both sides.



MODIFICATIONS. The provisions of USASI A17.1 1965 shall be subject to the following modifications. The following paragraph numbers and references are from that standard.

110.1A "and shall be at least 6 ft. 6 in. and have a clear width of door opening of at least 2 ft. 8 in.

Recommendations

*a. All public buildings of more than one story must have at least one passenger elevator easily accessible from an accessible primary entrance.

*b. At least one elevator in each bank of elevators shall be equipped with handrails and should be so identifiable. Height of handrails shall be 36 in. from the floor on three sides for ambulant handicapped & elderly persons.

*c. Alarm and Emergency buttons must be easy to push or touch sensitive; placed at a height no greater than 40 in. from the floor. (See Illustration - 7A - 7B.)

*d. All signal buttons inside and outside elevators must have raised or indented block letters and/or numbers so as to be indentifiable by blind persons, and preferably to be white letters and/or numerals on black background for the partially sighted.

*e. It is recommended that there be audible and visual signals indicating the up or down direction of the elevator and that the audible signals be sufficiently different for the blind to distinguish. (Higher pitch for up and lower pitch for down, or single note for up and double note for down.)

*f. Electric eye doors are preferable wherever possible.

*g. The minimal measurement of the interior elevator cab should be 5 ft. wide x 5 ft. 6 in. deep.

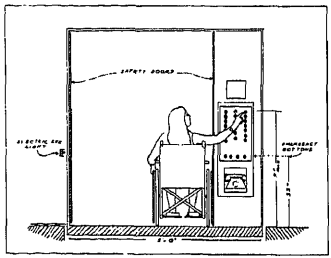


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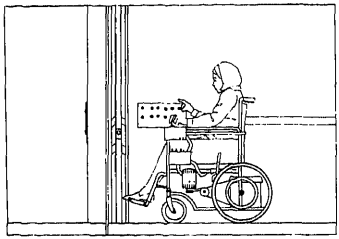


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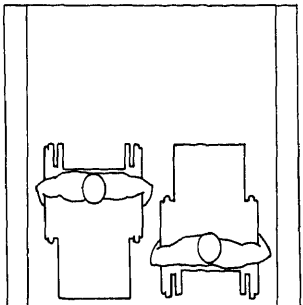
IX Hallways

Recommendations

*a. Protruding signs must be at least 7 ft. high. (See Illustration - 2F.)

*b. Minimum 60 in. in width.

*c. When necessary obstructions are required in a pedestrian area, they shall be placed in line with one another to reduce the hazard to blind persons and others. Fire fighting equipment is excepted.



X Public Walks

Recommendations

*a. Should not have a gradient of more than 5% when topography allows.

*b. Wherever walks cross other walks, driveways or parking lots, they should blend to a common level.

*c. Should have continuing common surface uninterrupted by steps or abrupt changes in level.

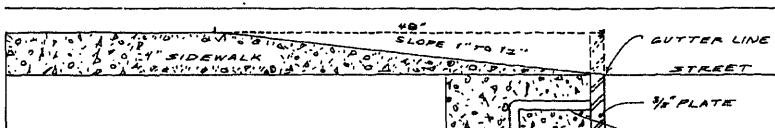
*d. Should be a minimum of 60 in. wide.

*e. If doors open onto walkway a minimum level area of 5 ft. wide x 6 ft. deep is required. One foot to extend beyond each side of door.

*f. Should be totally unobstructed when possible.

*g. Necessary or desirable obstructions should be placed in line with one another for the safety of the blind and ease of mobility.

*h. Wherever curbs are required, curb cuts must be provided at all intersections and other crossing areas. Cuts must not exceed 1" in 12" or 8%; 1" in 20" or 5% is preferred. All cuts must blend to a common level with the street and have a minimum width of 36 in.; 48 in. is preferred. (See Illustration 9A-C.)



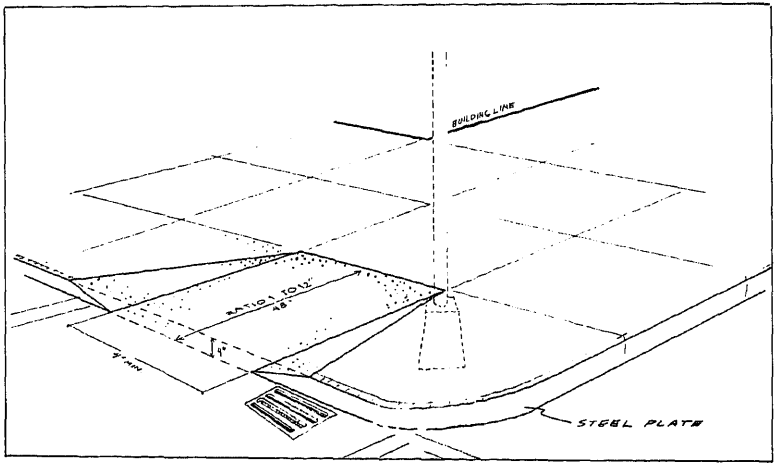


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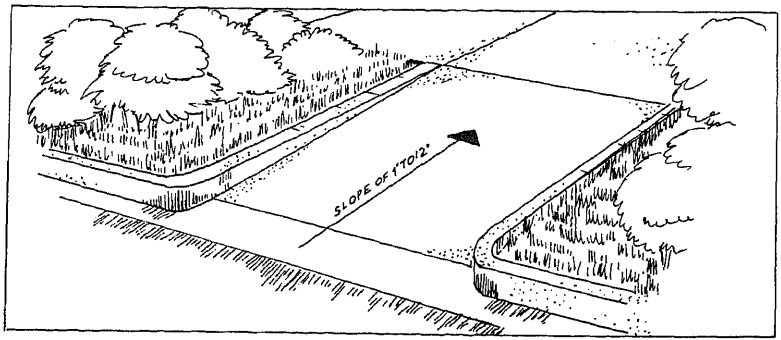


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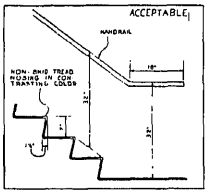
XI Stairs and Steps

Recommendations

**a. It is recommended that the maximum height of risers for each step be 6 in. in all buildings without elevators and other areas having flights of stairs.

*b. Avoid abrupt (Square) nosing -- eliminate nosing whenever possible. (See Illustration 10A.)

*c. Handrails should extend 18 in. beyond to and bottom of staircase unless it presen a safety hazard. (See Illustration - 10



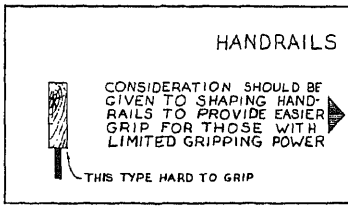


Illustration No. 10A

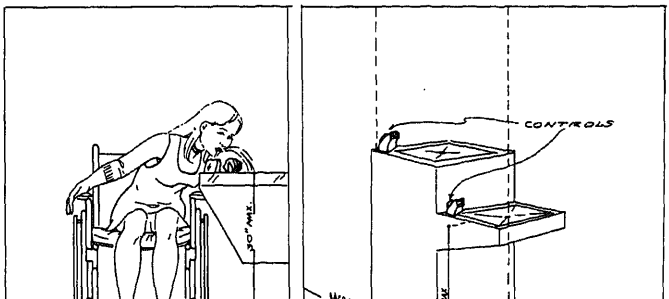
XII Drinking Fountains

Recommendations

*a. Outdoors: At least one or an appropria number should be no more than 30 in. hi not wall recessed and operable by hand.

*b. Indoors: At least one or an appropriat number should be no more than 30 in. hi wall recessed front of fountain flush w walk.

*c. Spout and controls near front edge of f tain.



XIII Public Telephones

Recommendations

*a. One or an appropriate number should have coin slot no higher than 40" from floor; 36" door; low hinged seat so as to be usable by persons in wheelchairs or small people.

*b. At least one public telephone should be equipped for use by hard of hearing persons and should be so identified.

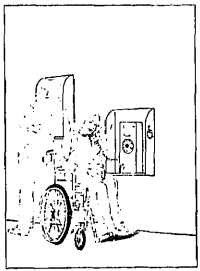


ILLUSTRATION NO. 12A

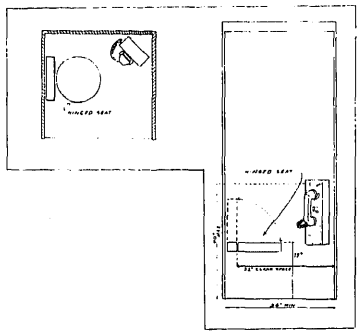


ILLUSTRATION NO. 12B

Note: New York Telephone Company has wide range of special equipment.

XIV Warning Signals related to safety

Recommendations

*a. Audible warning signals shall be accompanied by simultaneous visual signals for the benefit of those with hearing disabilities.

*b. Visual signals shall be accompanied by simultaneous audible signals for the benefit of the blind.

*c. The approaches to entrances, exits, changes in level and danger areas shall have discernably different floor texturing as a warning

XV Parking Lots and Garages

Recommendations

*a. Spaces that are accessible and approxi
to the facility entrance should be set
identified for use by individuals with
physical disabilities.

*b. Parking spaces open on one side, allow
room for individuals on braces and cru
to get in and out of an automobile ont
level surface, suitable for wheeling a
walking, is adequate.

*c. Parking spaces when placed between two
ventional, diagonal or head-on parking
spaces, should be 13 feet wide.

*d. Care in planning should be exercised s
individuals using braces and crutches
not compelled to wheel or walk behind
cars.

*e. Consideration should be given to the d
tion of spaces for use by the disabled
accordance with the frequency and pers
of parking needs.

*f. Number of spaces required to be provid
the handicapped.

Capacity	Numbers of Spa
7 to 50	Minimum of 2
51 to 100	Minimum of 3
101 to 150	Minimum of 4

Note: Refer to C26, 601.1 (d)

Public Garages occupancy groups B1 and B2 are no
quired to meet Building Access Standards. To create
accessible building with an inacessible garage would
to defeat the concept of total accessibility.

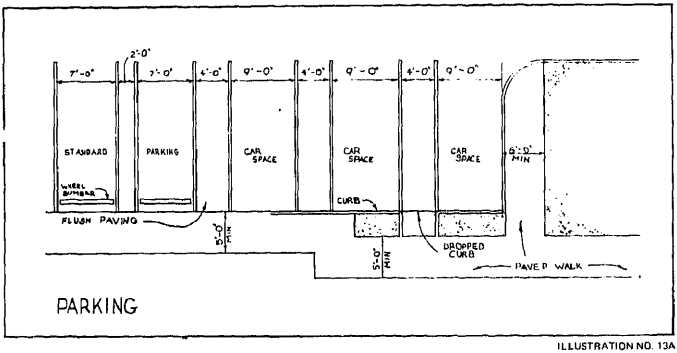


ILLUSTRATION NO. 13A

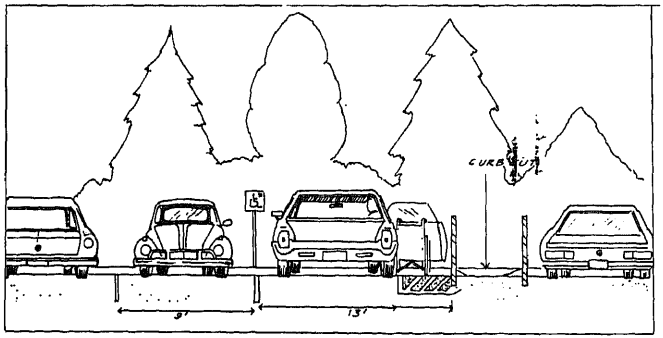


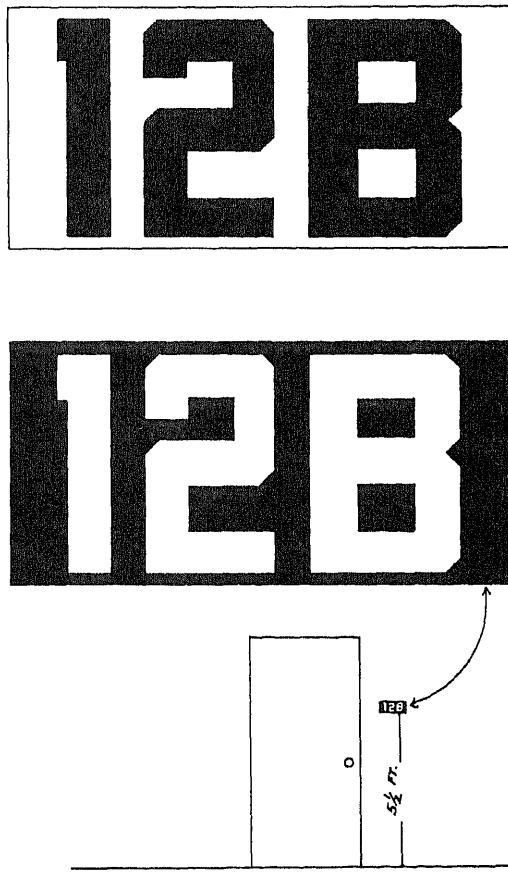
ILLUSTRATION NO. 13B

XVI

Recommendations, Door Letters and/or numerals, excluding commercial identification.

*a. It is recommended that they be white lettering on black background: 2 1/2 in. to 3 in. height. Either raised or indented block lettering and approximately 5 1/2 ft. above floor level on right side wall or door frame.

*b. Letters and/or numerals under 1 in. in size should be raised block lettering - those more than 1 in. in size may be either raised or indented, but should be block letters in either case.


128
Not
Recommended
128
2½"
Preferred
128
5½ ft.

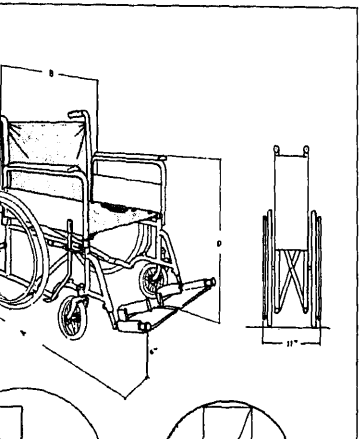
WHEELCHAIR SPECIFICATIONS

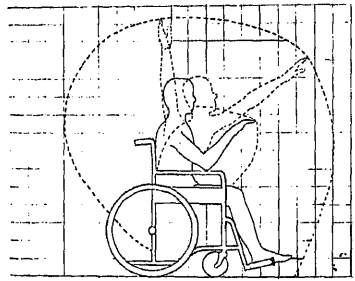
These are specifications for an average wheelchair for an average sized person. Chairs are made to accommodate persons with larger dimensions. Of course, motorized chairs come as wide 29", with 6" allowance for additional equipment.

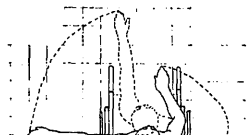
ADULT CHAIR MEASUREMENTS
(Non Motorized)

		STANDARD	RANGE
A	Length Over-All	41 1/2	39 - 45
B	Width Over-All	24	24 - 25 1/2
C	Height Over-All	36	36 - 42
D	Height: Arms from floor	29	29 - 31 1/4
E	Height: Seat from floor	19 1/2	19 1/2 - 22
	Footrest: Min. Extension	14 1/2	13 - 16 1/2
	Footrest: Max. Extension	20 3/4	19 1/2 - 20 3/4
	Wheel Diameter: Front	8 or 5	5, 8,
	Wheel Diameter: Rear	24	20, - 24
	Folded Width	10	10 - 11 1/2

Height of pusher handles (rear) from floor: 36"
Front to rear 42" with additional 4" to 6" for persons' foot extension
Turning space (180° & 360°): 60" x 60"
Elbow room required for chair movement: 6" on each side.







BARRIER-FREE CHECKLIST

1. Parking Lots

☐ Spaces should be 13' wide when placed between two conventional diagonal head on parking spaces.

☐ Not compelled to wheel or walk behind parked cars.

☐ Number of Spaces:

Capacity	Number of Spaces
7 to 50	Minimum 2
51 to 100	Minimum 3
100 to 150	Minimum 4

☐ Where there are curbs there should be curb cuts.

2. Curb Cuts

☐ Maximum 8% gradient or 1" rise in 12'

☐ Blend to a common level with walking area

3. Walks

☐ Minimum 60" wide

☐ Maximum 5% gradient or 1" rise in 20'

☐ Nonslip

☐ No abrupt changes in level

4. Ramps

☐ Minimum of 36" in width

☐ Maximum 8% gradient or 1" rise in 12'

☐ Handrails on both sides 32" high extending 18" beyond top and bottom of ramp

☐ Midrails 22" high

☐ Safety edges 2" high, 4" wide

5. Entrance

☐ NYC Building Code mandates at least one primary entrance to each building be accessible

6. Doors & Doorways

☐ Opening no less than 36"

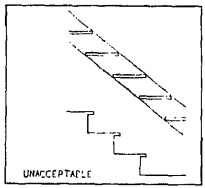
☐ Operable by a single effort

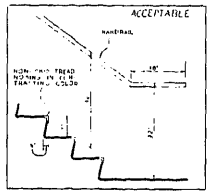
☐ No more than 8 lbs. pressure required to open

7. Stairs

☐ Should not have abrupt (square) nosing; it is preferable to eliminate nosing.

☐ Discernably textured flooring minimum 24" at all landings for benefit of blind.





☐ stair handrails should be 32" high as measured from the tread of the riser.

8. Floors

☐ Nonslip surface

☐ No abrupt change in level

9. Restrooms

☐ 36" entrance door

☐ If there is an internal entrance door, inside door should be multi-directional free swinging type

☐ Urinal not more than 15" from floor

☐ Amenities, ie. towel dispensers, mirrors not more than 40" from floor

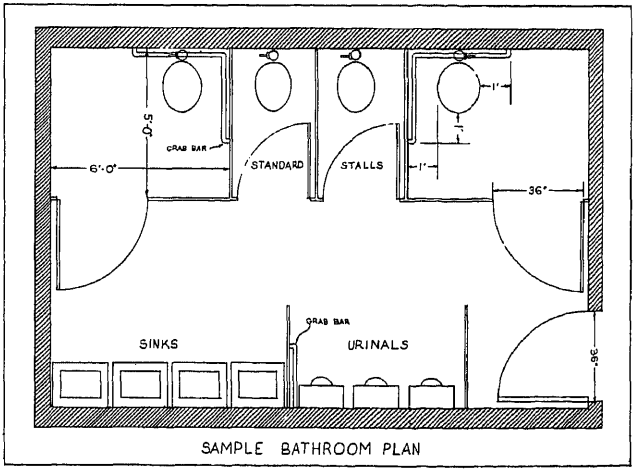
☐ Sink-27" clearance from floor

☐ Toilet stall size 5' deep x 6' wide

☐ Water closet wall mounted 18" from floor at one corner on back wall

☐ Door opening diagonally across from bowl

Note: Ideally two for each sex as in diagram.



SAMPLE BATHROOM PLAN

Illustration No. 5D

10. Drinking Fountains - appropriate number

☐ No more than 30" in height - non recessed for outdoo

☐ Recessed if indoors - front of fountain flush with wall (not inside alcove)

☐ Operable by single hand motion; lever type preferable to knob

Note: New Fountains available built like inverted "L"

11. Public Telephones - appropriate number

☐ Coin slot no higher than 40" high

12. Showers appropriate number

☐ Alternate 1: - Transfer from wheelchair to seat from outside or shower seated in wheelchair:

☐ Size 3' x 4'

☐ 36" door opening outward - curtain preferred

☐ Hinged seat 15" deep along side wall

☐ Secondary flexible tube shower spray adjacent to controls

☐ Controls on back wall near seat side (within easy reach)

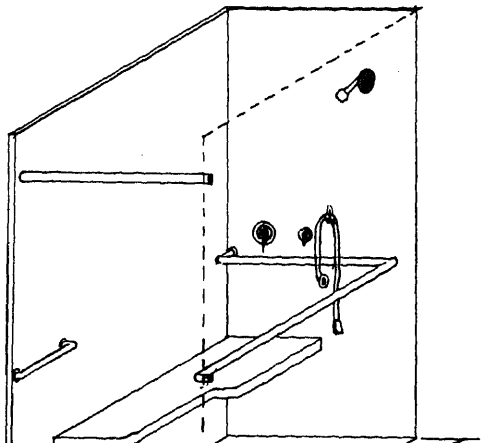
☐ Grab bars 33" high, 1 1/2" in diameter, 1 1/2" from wall as illustrated

☐ Alternate 2: - Transfer from wheelchair inside stall

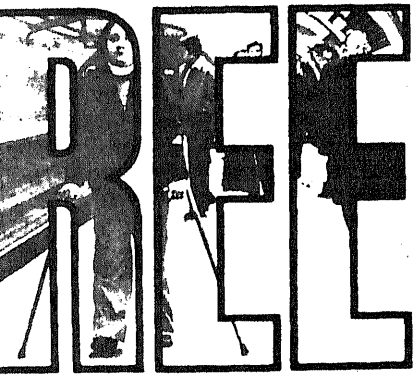
☐ Size 5' x 6'

☐ 36" door opening outward - curtain preferred

☐ Raised entrance bevelled on both sides to blend to a common level with floor. Seat - shower spray - controls same as alternate 1.



BARRIER



FREE

SYMBOL OF ACCESS

Published by
Rehabilitation International
as a project of the
Decade of Rehabilitation

DESIGN

with

our

compliments



INTERNATIONAL SYMBOL OF ACCESS

REHABILITATION INTERNATIONAL is a non-governmental federation of national and international organizations providing rehabilitation services for disabled people. The only international organization concerned with all aspects of disability and rehabilitation, it maintains official relations with the United Nations Educational, Scientific and Cultural Organization (UNESCO), the United Nations Economic and Social Council (ECOSOC), the World Health Organization (WHO), the International Labour Office (ILO), and the United Nations Children's Fund (UNICEF). It also provides the secretariat for the Council of World Organizations Interested in the Handicapped (CWOIH).

The 1970's have been proclaimed the **Decade of Rehabilitation** by Rehabilitation International a global program designed to mobilize international resources for the

This report is available for US$5.00 from the publisher, Rehabilitation International, 122 East 23rd Street, New York, N.Y. 10010, USA.

Cover photo credit:
The New Zealand Society for Crippled Children.

Ana Muller, Spain.

United Nations.

BARRIER FREE DESIGN



Published by
Rehabilitation International
as a project of the
Decade of Rehabilitation

Report
of the
UNITED NATIONS
EXPERT GROUP MEETING
on
BARRIER-FREE DESIGN
HELD
JUNE 3-8, 1974
AT THE
UNITED NATIONS SECRETARIAT
NEW YORK

Editors:
Susan Hammerman
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Design & Layout:
Barbara Duncan

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"Full, Fruitful and Useful Lives"

Foreword by the Secretary General of the United Nations

I am very grateful to Rehabilitation International for enabling the Report of the United Nations Expert Group on Barrier-Free Design to be made available to a large public audience.

We in the United Nations are very aware of the importance of international co-operation in dealing with the problems which confront handicapped people everywhere, and it is my earnest hope that the initiative of the United Nations Centre for Social Development and Humanitarian Affairs in convening this Group of Experts will lead to much greater international understanding of the particular requirements of the handicapped, to enable them to live full, fruitful, and useful lives.

I warmly commend this publication, and am deeply grateful to all who have been involved in its preparation.



Kurt Waldheim

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Barriers–Physical and Social

Foreword by the Secretary General of Rehabilitation International

Despite everything we do, or hope to do, to assist each physically or mentally disabled person achieve his or her maximum potential in life, our efforts will not succeed until we have found the way to remove the obstacles to this goal erected by human society—

the ***physical barriers*** we have created in public buildings, housing, transportation, houses of worship, centers of social life and other community facilities

the ***social barriers*** we have evolved and accepted against those who vary more than a certain degree from what we have been conditioned to regard as normal.

•

More people are forced into limited lives and made to suffer by these man-made obstacles than by any specific physical or mental disability.

•

That being so, and it being essential that the people of the world understand these problems and the necessity of doing something about them, Rehabilitation International has been pleased to cooperate with the United Nations in the planning of the first U.N. Expert Group Meeting on Barrier-Free Design, in the work of the Expert Group and now in the publication of its report.

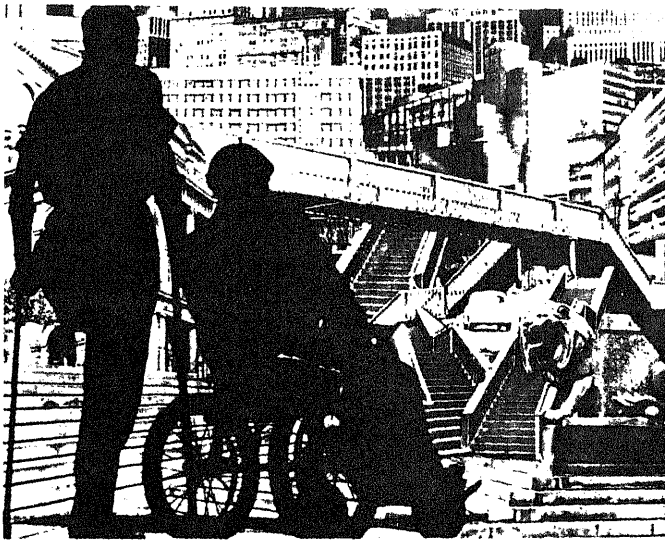
•

Believing that the report should be made available in a form that would attract the interest of a large audience throughout the world, Rehabilitation International offered, and the United

The report is published as a project of the Decade of Rehabilitation, a special campaign of Rehabilitation International to mobilize during the 1970's increased interest in the problems of disability, their prevention and the rehabilitation of disabled persons. None of these problems exists without the ones dealt with in this report: environmental barriers and their elimination. We must be grateful to those individuals and organizations who, as Sponsors of the Decade of Rehabilitation, have helped make this volume possible.



Norman Acton
Secretary General
Rehabilitation International

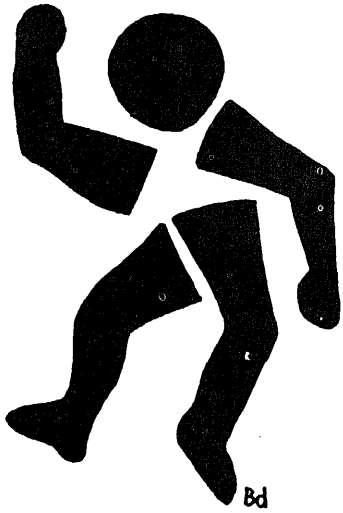


(photo credit: Franzi Schrag, Blutenburg Strasse, Federal Republic of Germany).

Supplementary material to accompany the recommendations of the United

"The Challenge"

Mythical Mr. Average



As stated by Panayiotis Psomopoulos, Athens Center of Ekistics, Greece,

> **"One major cause of disabling settlements is that they are built for a non-existent population. Buildings, roads, open spaces cater to a fictitious model of the human being—exclusively for a man (not a woman) in the prime of life and the peak of his physical fitness.**
>
> **Statistically speaking, only a small minority of the population can fall into this category, even among the fit. Naturally, there is no thought for the handicapped."**

Flights of stairs, protruding thresholds, revolving doors, narrow entranceways: all combine to turn the

In addition to these obstructions of the static environment, buses, trains and airplanes, meant for mobilization of the public, often immobilize these same citizens by the physical impediments to their usage.

The design of dwellings, public buildings and mass transportation for the exclusive enjoyment of Mr. Anthropometrically Average has long been with us:

> **"Over the centuries, the architect has taken advantage of the apparently unlimited ability of the human being to tolerate discomfort, inconvenience and, even danger. *The concept of fitting the activity of the equipment to meet the needs of the human being rather than vice versa, is still so new that the term by which it is known, ergonomics, is one that few people have any knowledge of.*"**
>
> Selwyn Goldsmith
> *Designing for the Disabled*
> United Kingdom

Recently, however, we have begun to realize that the application of a theoretical ideal to the solution of architectural problems is unacceptable to an ever increasing percentage of the world's population:

> **"When transferring the needs of the people in their everyday lives into the environmental development of human settlements, it is very necessary to keep in mind that 10%, and possibly as many as 20%, suffer from some form of disability. About 30% of these are orthopedic cases."**
>
> Maurice Strong,
> Director, United Nations
> Environment Program

> **"The truth is that there is no clearly defined separation between the well and the infirm and that in our time many of those considered well will suffer some infirmity.**
>
> **The old idea that a barrier-free architecture is catering to a minority is no longer valid."**

protective of all members of society."

Norman Acton
Secretary General
Rehabilitation International

The Universal Complaint

"Architectural barriers are undoubtedly the most universal complaint voiced by disabled people. This is because they provide a hindrance to a very broad spectrum of disabling conditions, and because they have the effect of restricting severely the mobility of large numbers of disabled people.

They affect all kinds of human activities, from doing the weekly grocery shopping or going for a beer at the local pub, to pursuing employment, taking a vacation or seeking cultural, recreational or educational fulfillment."

Canadian Rehabilitation Council
for the Disabled

Economic Waste

In addition to the abrogation of human rights of disabled people, architectural barriers also bring about vast amounts of economic waste:

"In spite of the half billion tax dollars invested in the vocational rehabilitation of the disabled, hundreds of disabled men and women find their path to independence blocked by manmade barriers.

Their arduous efforts to qualify for work are all in vain and the aid they received only adds to their frustration."

Design for All Americans
USA

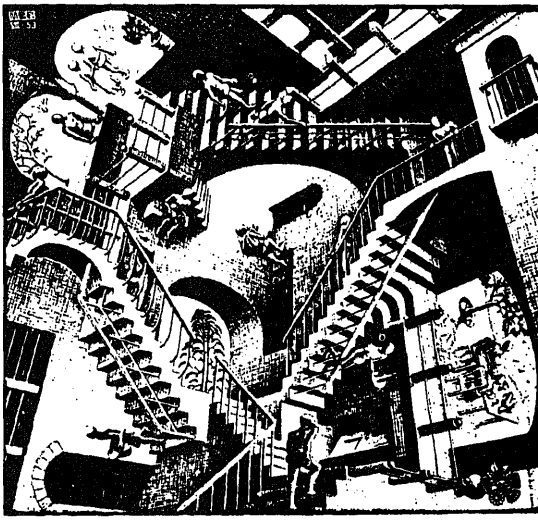
Independence and Liberation

"An important factor in the normal process of liberation is that society should offer young people the opportunity and motivation to act as adults. At present, society fails to support handicapped young people in this process—various architectural barriers stand in the way.

If further studies are proposed, the young handicapped person may not be able to get into the actual school or university buildings . . . when work is offered, handicapped young people often have no possibility of entering the place of work conveniently . . . if they want to meet other young people, they find it difficult to get into cinemas, theatres, community centers, etc. . . . if they want to leave home, they have difficulty in finding suitably equipped accommodation . . . if they want to visit their friends, they cannot get into their flats."

Inger Nordqvist
Life Together

As is recommended in this report, disabled people themselves are beginning to take a leadership role in the abolition of these barriers. There are examples from many countries, some cited in this report, of disabled people working together on guides to accessible facilities, addressing the public on television and through newspapers and bringing the problems to the attention of architects and urban planners.



The Challenge

It is up to all of us —

- disabled people who are beginning to champion their just cause
- governments, which must recognize their responsibilities to the needs of all citizens
- voluntary organizations and rehabilitation workers, who can coordinate the necessary programs
- and architects and planners, whose expertise is needed to solve these problems

to translate the conclusions of this report into action and meet the challenge of creating a barrier-free



All numbered paragraphs are approved text of the UN Report on Barrier Free Design. Supplementary information, charts, photographs and Annexes 1-4 are provided by Rehabilitation International.

HANDICAPPED YOUTHS SURVEY BUILDINGS
Federal Republic of Germany

I Introduction

1. Progress in medical science has increased the survival rate o victims of accidents, disease and disability to a near normal lif expectancy and has greatly extended the life span of the elderly an the infirm. Modern day technology possesses the skills and technique which would enable such persons to be productive members of society However, the large majority of handicapped people do not have th benefit of the resources available because our society is unaware o their needs and uninformed of the solutions.

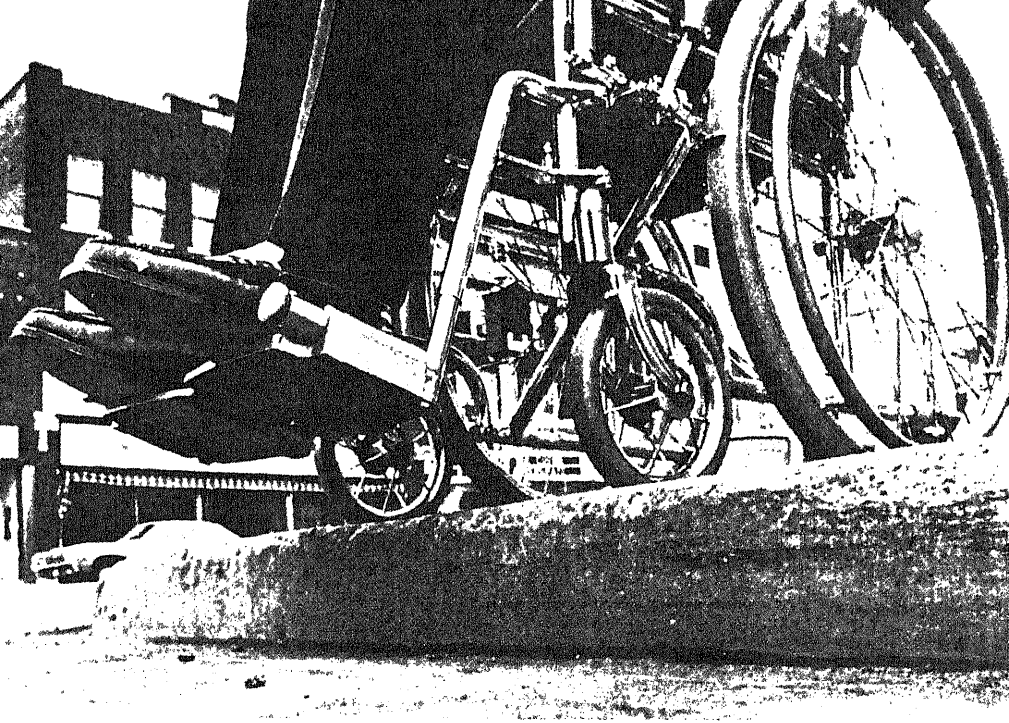
2. The United Nations, in its Declaration on Social Progress an Development[1] has envisaged the institution of appropriate mea ures which would enable disabled persons to gain or regain the rightful place in society. This objective was reinforced at the Unite Nations Conference on the Human Environment in 1972 and the ple ary meeting of the Council of World Organizations Interested in th Handicapped (CWOIH) in July 1973.

3. As a result of a recommendation submitted by the CWOIH, th United Nations undertook to organize a United Nations Expe Group Meeting on Barrier-Free Design. The purpose of the meetin was to analyze the architectural barriers as well as their social impl cations affecting the lives of handicapped persons in their normal dai activities and to propose what measures may be needed for eliminatin these barriers.

4. In analyzing the architectural standards and the legislative pr cedures used by various countries, the meeting was asked recommend criteria for international standards which would facilita the social integration and improve the economic welfare of physicall handicapped people throughout the world.

II General Concepts

5. In addition to the need to upgrade the technical aids and th quality of the environment, it was suggested that the socio-ps chological aspects of rehabilitation had not kept pace with the progre in medical areas and that this was a vital factor in total rehabilitatio This included the preparation of the handicapped to accept mo responsibility for self-determination and take their rightful place society. In using the team approach, the problems of the disabled ha to be viewed in the context of the entire social and work environme



(photo credit: Minnesota Society for Crippled Children and Adults, USA).

6. The discussion then turned to those factors which impede progress in the rehabilitation of the handicapped. It was suggested that although there are many activities in various countries focused on the integration of the handicapped in the form of building standards and legislation, the main stumbling blocks towards progress are that:

a. the world does not realize
the *importance* of this problem;

b. it is felt that the *technical problems* are too difficult to solve;

c. it is believed that
the *cost* involved is excessive;

d. there is a definite lack of *co-ordination* of effort;

e. there is a need to improve *methods of implementation.*

COSTS

"A study carried out by Milton Keynes Development Corporation showed that the cost of making physical adaptations to a house for a wheelchair user is up to twice as high as incorporating the adaptations at the design stage. From the design point of view, good principles can be incorporated at the initial stages– for example, a ground floor bathroom is suitable in general, not only for disabled and/or elderly people. Incorporation of such features on a wide scale could help eliminate the need to re-house elderly and less severely disabled people in their retirement years."

Interim Report of the

disabled, can be accomplished with little, if any, increased cost.

Maurice Strong

comparison of costs between barrier-free design resulting in independence and employment of the handicapped and the cost of segregating this section of society forcing them to be dependent on the community were made known, politicians as well as planners would opt for complete integration by means of barrier-free design.

CLASSIFICATION OF REQUIREMENTS IN DWELLINGS

General requirements without negligible increase in cost (group 1)

1. Locally bevelled kerb
2. Sufficiently wide footway with surface of closed texture, without steps etc.
3. All electric switches and push buttons, including the front door bell, at a height of approx. 90-100 cm, max. 120 cm
4. All doors clear width min. 85 cm, no door springs that are too tightly adjusted
5. All window closures at 90-120 cm
6. Height of window sills 60 cm, at most 85 cm
7. Sunken doormat at front door
8. No thresholds, but if necessary height max. 2 cm
9. No slippery floors
10. Possibility to combine, if necessary, shower and toilet space by an easily removable structure
11. Stairs with correctly formed closed steps and sufficient handrails
12. Contrasting colours on stairs, door frames etc. for the visually impaired
13. Continuous handrails on stairs, variation of floor material in connection with blind and partially sighted

(Reprinted from Independent Housing for the Handicapped, publication of the Netherlands Society for Rehabilitation. See Annex 3.)

Special requirements, useful for everybody, with some extra cost (group 2)

1. Garage or, if not possible, car-port of sufficient size with a direct entrance to the dwelling
2. If differences in level: ramp
3. Instead of high doorsteps, a low doorstep of max. 2 cm with grating
4. Small cupboard that can be opened both on outside and inside next to front door, for delivered articles
5. Letterbox with attached receptacle
6. Top windows, easy to open, also from sitting position
7. Large capacity of ventilation
8. Ample capacity of central heating
9. Good possibility for sun protection
10. If lifts, inner measurements 110 cm wide and 140 cm deep. Clear width of door 80 cm. Telescopic door is preferable. Max. height of push button 150 cm, preferably 120 cm
11. Sufficient space in halls, corridors, kitchens and rooms so that a wheelchair user can manoeuvre in it. On the lock side of door free width of approx. 50 cm
12. Good accoustics and sound insulation
13. Easily accessible terrace or balcony with protection against sun, wind and rain
14. Open kitchen with air extractor

NB When planning, the possibility of later installing a chair lift or platform lift should be taken into account. For the latter a wide straight staircase is necessary.

Extra requirements on behalf of wheelchair users, to be added to the special dwellings intended for them (group 3)

1. Enlarged garage with electric door-opener, or carport. If impossible, then a reserved parking space
2. Direct access from garage to dwelling
3. Alarm installation, visible outside
4. Room for storing (electric) wheelchair
5. Adapted hall-stand
6. Sliding doors where possible
7. Special bars and handles on doors, special hinges and locks etc. If necessary automatic door-opener
8. Protection of bottom of doors and door frames against damage, as well as protecting boards along the walls in corridors
9. Protection of corners in halls, rooms etc.
10. All rooms to be easily reached, if necessary with a lift or stair lift
11. Adjustable kitchen work top and protected sink with open space underneath. Various kitchen requirements
12. All cupboards, ovens, refrigerators, other apparatus and pan shelves easily reachable from wheelchair
13. Hot-water pipes must be insulated where contact is possible. Shower if necessary with thermostat
14. Special bathroom with shower, toilet and washbasin, accessible from bedroom and passage-way
    Height of wc adjusted to handicapped user, further requirements such as: swing up arm rest, special wash basin. Floor of shower sloping without raised edges and with floor siphon. Adjustable hand-shower
15. Second ordinary lavatory, if more than two occupants
16. Alarm installation in lavatory bathroom and or elsewhere if advisable
17. Door intercom and electric door opener, to be operated also from living-room and bedroom

"Although the physical incapacities of disabled people are sometimes severe, they do not—with the exception of people confined to wheelchairs—pose new problems to the architect, but only more extreme degrees of existing ones. The 'normal' person is liable to fall on a polished floor, slip in the bath, or trip over a threshold; he has limitations of reach and he can see clearly only over a limited distance. The methods of solving these and similar problems do not alter if provsion is made for people who are disabled, they merely gain in significance.

Selwyn Goldsmith



(reprinted with permission of the

accepted international policy and insufficient co-ordination by governments. The United Nations could provide the stimulus needed by issuing guidelines on barrier-free design to all countries. On the part of the handicapped themselves, there is insufficient understanding of their own demands. Only a limited number of disabled persons belong to any kind of organization of the handicapped, and it would be of great value if agencies dealing with the disabled could stimulate their efforts as well as their local, national and international bodies to be more active. Given the necessary training and qualifications, the disabled could represent themselves and do so more effectively since the problems being dealt with are theirs.

France

The conclusions of an interministerial working group on Housing of the Physically Handicapped, published in May, 1973, state that:

(1) Adaptation for the use of the physically disabled of building approaches, building accesses and entrances to the building involves NO EXTRA COST, when these adaptations have been considered at the planning stage. (2) The addition of a lift to a lodging involves extra cost according to the following table:



Disabled citizens of New York City block traffic in a demonstration against a gasoline allotment program, in effect statewide, Spring 1974. They won exemption from the program, which would have restricted purchase of gasoline. (Reprinted from Polling Magazine, a consumer advocacy publication of United Cerebral Palsy of New York City.)

R: Rez de Chaussee (ground floor)

Building	*Minimum%*	*Maximum%*
R plus 2	**4.5**	**17.6**
R plus 3	**3.8**	**14.2**
R plus 4	**3.3**	**12.2**
R plus 5	**0.9**	**4.5**
R plus 6	**0.5**	**1.6**
R plus 7	**9**	**0**

(3) Regardng stairs, extra cost ranges from 0.3% to 0%, depending on the number of lodgings per floor. (4) Applying the minimum requirements of accessibility to the internal arrangement of the lodging involves a variable extra cost, depending on the

10. It was pointed out that although at times the lack of statistical data may be used as an excuse for not developing the appropriate environment, the cost-benefit analysis may not be the best method justifying the needs. Justification should be predicated on the basis of human rights and socio-psychological aspects. It would be helpful to

PUBLIC EDUCATION CAMPAIGN

United States

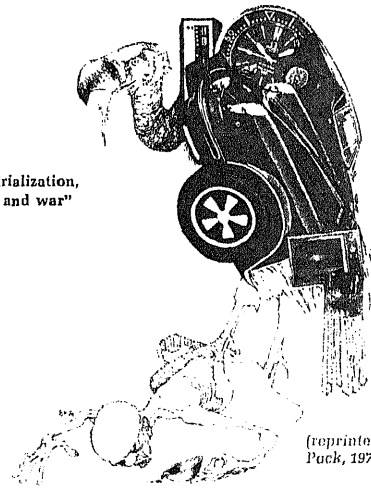
Hundreds of architects, city officials and interested citizens have had a chance to experience first-hand the architectural barriers encountered daily by disabled people on a portable "obstacle course," containing both accessible and inaccessible facilities. The course, which includes ramps, telephone booths, lavatories, water fountains and a minature house to illustrate entrances and threshhholds, can be transported in a truck and is equipped with 12 wheelchairs for participants. Built by the Minnesota Society for Crippled Children and Adults, the exhibit is here further described by William Hopkins, Public Affairs Director of the Society:

(a) Ramps are demonstrated by 3 different slopes, 1 foot rise in 6 feet, 1 in 10 and 1 in 14. Materials cost approximately US$250, plywood supported by aluminum. (b) Telephone booths were constructed as a donation by the local utility company, coin drop set at 48 inches above floor. (c) Toilet fixtures cost US$600 and the compartments were donated by a manufacturer: compartment width 42 inches and depth 8 feet, allowing 90 degree turn inside. (d) two steps, 3 feet wide are constructed from plywood as a reminder that steps and stairs are the number one enemy of the disabled. (e) We purchased 4 doors and the materials to construct a roofless 5 feet by 7 feet "house." Constructed in sections for mobility, cost, approximately US$300. A dozen wheelchairs were purchased at a discount cost of approximately $1000.

Participants are given a guide to using the obstacle course, which points out the advantages and disadvantages of all features. The guide concludes,

> **"We trust you now have some feeling for what the handicapped person experiences everyday of his life and that this exhibit has enlightened you on why certain specifications—not greatly different from the standard, yet critical, are required to make our physical environment more functional for all people."**

11. Within the context of the general concepts relating to the subject under discussion, a paper entitled Mobility of the Handicapped[2] was summarized. It was noted that "for decades, Society has ignored, not to say slighted the handicapped, considering them in many countries as a hindrance, as a disgrace, a burden which his family or perhaps the State should bear, and although incomprehensive and cruel, that attitude was logical, as the census of the handicapped was small, and only affected a few and their number did not interfere with the country's economy. But *industrialization, speed, and war* have made the problem more acute. Society, perhaps due to the eloquence of numbers, has become sensitive and public powers have understood the need to recognize to those hundreds of thousands of beings who lived set aside, the same rights as other men on proclaiming the Declaration of Human Rights, and in it the right to health, the right to rehabilitation was implicitly recognized.

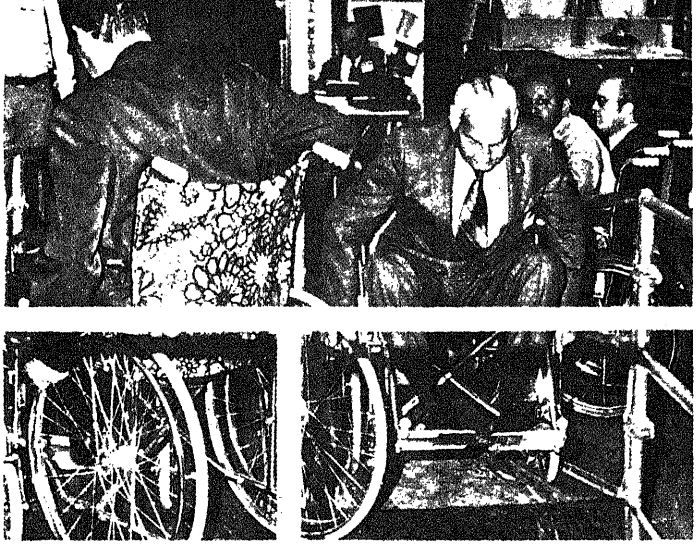


"industrialization, speed and war"

(reprinted from UN Action Pack, 1974.)

12. The handicapped, who, by the fact of being so, has not lost his quality of being a man, whom mutilation or deformation have not removed his human quality, must have the same rights which the Declaration grants to the fit, the strong, to all men and therefore, he has the right to *work*, to *education*, to *culture*, to *sport*, to *leisure* . . ."

13. The meeting agreed only in part with the statement that it is to the lack of knowledge, and not to the lack of sensitivity or the lack of interest by their fellow men, that we must attribute the fact that architectural barriers repeat themselves over and over again, cancelling out the social and rehabilitating action which the law proposes. For this reason, it is increasingly necessary to intensify by all possible



Architects experience architectural barriers on a portable "obstacle course."
(See opposite page for story.)

sionals and to society so that all know what the architectural barriers are and how they affect the lives of the handicapped. What is needed is the kind of urban development in which everyone, the healthy and the sick, young people and old and the handicapped can live and move freely, without hindrances, without impediments.

14. With reference to promoting and expediting the necessary changes of both the physical and attitudinal barriers of society, attention was drawn to the role of the *voluntary agencies*. It was agreed that the unique characteristics of volunteers in their ability to involve recipients of their services in the process of planning and carrying out of programmes, afforded a special opportunity for mobilizing and directing community effort. To ensure understanding and acceptance of a formal set of standards to define accessibility specifications, building trades, insurance, labour unions, architects and a wide range of concerned groups could be brought together and become involved. Such involvement could often elicit assistance in funding by voluntary service groups as well as support requests for funding by government departments.

15. In addition, involvement of voluntary agencies was often crucial to the process of monitoring the effectiveness of the method of implementing regulations. This was particularly significant where the administrative procedures for implementing were lacking. Equally

CAMPAIGN

Belgium

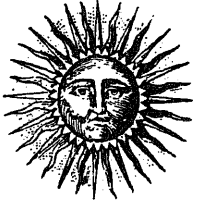
The following is an example of a national campaign to abolish architectural barriers, organized by the Belgian branch of the Red Cross, voluntary organization. At present, th Red Cross is the institution recognize for the centralization and spreading of all national and international data useful to physically handicapped people, with the exception of medica material. This service reaches the public through press, radio, television films and exhibitions and acts as a technical center to gather data and study any problem relating to the soci rehabilitation of the disabled. The Re Cross has also assumed responsibility for publicizing the International Symbol of Access and the problems of architectural barriers. Thousands of questionnaires in French and Flemish have been sent to provincial, postal and tourist offices who are requested to evaluate the accessibility of facilities in their locale. After a follow-up visit by a Red Cross delegat Symbol of Access decals are awarded to those meeting the minimal criteria.

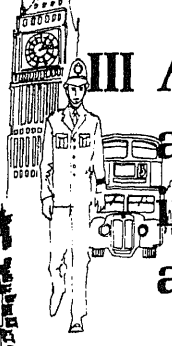
VOLUNTARY ORGANIZATIONS FORM NATIONAL CAUCUS

Canada & United States

A national caucus on architectural barriers, composed of the major voluntary organizations concerned with disability, has been formed recently in both Canada and the United States. The Canadian Rehabilitation Council for the Disabled, of which nearly 100 voluntary groups are members, now serves as a coordinating body betwee these associations and the Governmer on barrier-free design activities.

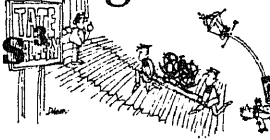
In the United States, eight national organizations concerned with architecture and disability have formed a National Center for a Barrier-Free Environment. Founding members are the National Easter Seal Society, the National Rehabilitation Association, the American Institute fo Architects, the President's Committee on Employment of the Handicapped, the National Paraplegia Foundation, Paralyzed Veterans of America,







III Architectural Barriers and their Elimination in Public Buildings and Facilities



16. The environment designed for the *average person* often does not take into consideration the wide range of mobility limitations caused by advanced age, physical disability or temporary injury. Such persons frequently find themselves *isolated* and segregated from the mainstream of society because they are unable to enter into the community and participate in its life.

17. At least *seventeen* nations (see Annex 1) have developed standards for design of buildings so as to make them accessible to and usable by persons with mobility limitations. These national standards possess some variations and differences with respect to dimensions and sizes. However, they all agree in their specific intent—to provide disabled persons and others affected by barriers with a clear expectation of their right to access to the man-made environment.

18. To expand this policy to a universal right of handicapped persons everywhere, the meeting recommended the adoption of at least minimum standards for all countries, *(see paragraph 24)* but in so doing, the meeting recognized the technological and cultural differences among the various countries.

19. In suggesting standards of design which are merely minimum, the group did not mean to discourage the adoption of specifications which are more liberal in their characteristics.

20. The group recommended these standards as *minimum* performance standards for all buildings and facilities to which handicapped persons have a legitimate right to enter and use—whether publicly or privately owned. It recommended them both for new constructions and for modifying existing facilities.

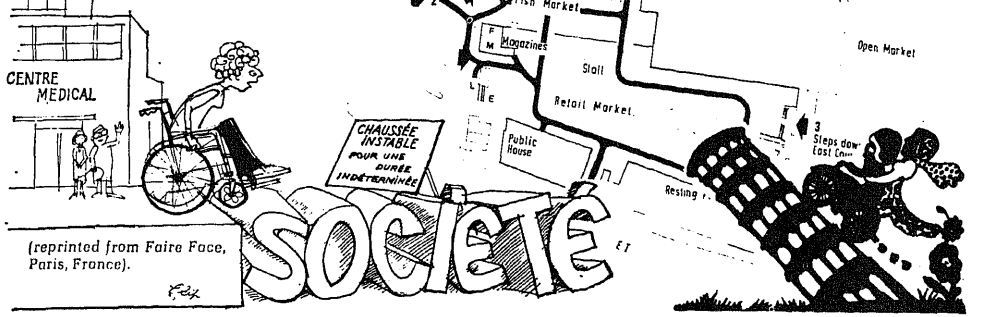
21. It is not intended that these standards constitute a separate or *complete design solution for persons with disabilities.* Rather it was suggested that by incorporating them into environmental design,

ACCESSIBILITY EVALUATION
Austria

New building regulations for Vienna, which are reported to take into account accessibility for disabled people, are being evaluated by the Austrian Working Party for Rehabilitation. The Working Party's conferences with government authorities have resulted in a citywide research program on needed services for the disabled as well as recent adaptation of theatre facilities in Vienna.

STANDARDS FOR PUBLIC FACILITIES
Federal Republic of Germany

The Deutsche Normenausschus in Berlin has issued standards for the construction of public buildings, public places and streets, as well as for apartments for the blind and severely visually-impaired and for wheelchair users. The standards for construction of public buildings and barrier-free designing of places and streets are

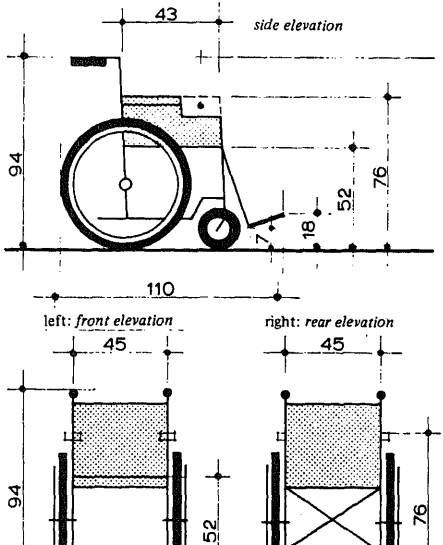


(reprinted from Faire Face, Paris, France).

22. It was decided to state these standards in terms of the performance or functional requirements which must be met to provide for accessibility. These functional requirements are illustrated with the examples of minimum measurements given in Annex 1.

23. The dimensions in that table are essentially based on a wheelchair of the dimensions of the following illustration from Architectural Facilities for the Disabled.[4] It should be kept in mind that wheelchairs may vary in the different countries. Certain types of electrically powered wheelchairs or other means of transport for the disabled may require more special arrangements.

[4]ICTA Information Centre and The Netherlands' Society for Rehabilitation. Architectural Facilities for the Disabled, The Hague, 1973.



possibly: stepped and reversible armrest

hand-rim for propelling the chair

foot-rest with adjustable height

note: there are several models of wheelchairs, including some with swivelling wheels at the rear; these models are usually shorter

the space occupied by the chair and required for manipulating it can, for the various models, be based on these diagrams

SPECIAL PROBLEMS OF AN OLD CITY

Italy

"Traffic is the main problem of all cities, but this is far more serious in old, historic places, where the width and layout of the streets are more suitable for carriages than for motorcars. Difficulties are increased by the narrowness or complete absence of footpaths, and by the hilly terrain on which some cities, such as Genoa, were built. . . . The following table shows how many of the various kinds of public buildings in Milan and Rome are totally inaccessible to those in wheelchairs:

	Theatres	*Cinemas*	*Museums*	*Secondary Schools*
Milan	**70%**	**45%**	**67%**	**—**
Rome	**57%**	**55%**	**83%**	**100%**

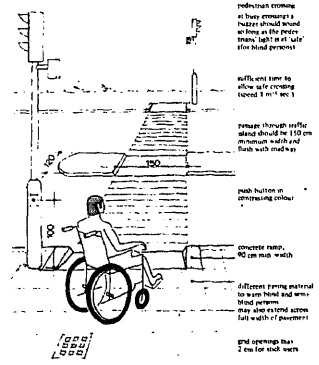
These figures give an idea of the seriousness of the situation to which the town authorities of Milan are beginning to give serious consideration. One of the first of the general measures is the banning of parking during most of the day in central business areas, and in certain areas, permanent banning of all vehicle traffic and parking. Ramps and sloped footpaths are planned to provide access to several historical sites. The measures already taken or planned are the first signs of awareness of a problem which we believe concerns all . . . old cities."

S. Boccardi and A. Ornati
COMMUNITY RESPONSIBILITY FOR REHABILITATION

	Shopping	Public Buildings, Culture, Entertainment and Recreation
Local Expeditions		
Local shops and facilities within walking distance of housing	Small General Store, Paper Shop, Tobacconist, Chemist, Post Office	Hall or Centre, Club, Church, Public House
Regular Expeditions		
District centre and County Town[1] accessible by public transport and with reserved parking bays for disabled drivers and setting down points for disabled passengers	Supermarket, Food Shops, Household Goods, Hairdresser	Government Offices (especially Employment Exchange and Social Security Offices), Bank, Police Station, Branch Library, Public Garden, Doctor's Surgery, Dentist, Health Centre, Cinema, Public Health, Restaurant and Café, Football Ground, Spectator Sports
Occasional Trips		
Sub-regional and Regional Centre accessible by public transport. Parking in multistorey garages. Vertical circulation within central area by passenger lift preferred.	Department Stores, Boutiques, Small Specialist Shops, Jewellery, Cameras, Furniture Shops Beautician and Hairdressing	Town Hall and Central Government Offices, Central Library, Technical College and Art School, Higher Education Centre, Hospital, Park, Exhibition Hall, Concert Hall, Museum Theatre, Cinema, Hotel, Restaurant and Bar, Sports Stadium, Swimming Pool

Complete accessibility requires attention to all aspects of the urban environment. Urban planners in the United Kingdom carried out a study in 1968 to determine how the planning of town centers could best accommodate the needs of disabled people. The above chart indicates the frequency of priority destinations for disabled people within a town and in Annex 2 a checklist from the study is reproduced as a guide to urban planners. (Chart reprinted from *Planning for Disabled People in the Urban Environment, Central Council for the Disabled, United Kingdom.*)

Sample Walkway



Recommendations

24. The following criteria were recommended as *minimum fuctional standards:*

a. **WALKWAYS.** The functional requirements of walkways is to provide a hard surfaced route sufficiently wide to permit a person in a wheelchair to traverse it with safety. If it is a lengthy or busy walkway, it should be so constructed that at some point along the route space is provided for a wheelchair to be turned around or to pass another.

b. **WIDTH OF CORRIDORS.** Corridors should be wide enough to permit a person in a wheelchair to traverse it avoiding conflict with the swing of doors, the instrusion of elements of the structure including columns and piers, fixtures—including drinking fountains—and equipment and to permit the passage of more than one wheelchair or for one to turn about should the corridors be of a length or have usage that would make such incidents likely.

c. **DOORS AND ENTRANCES.** At least one entrance to every building used by the public should be ground level or ramped to provide access to persons in wheelchairs. Entrances with vestibules should provide space to open the door and allow the wheelchair to

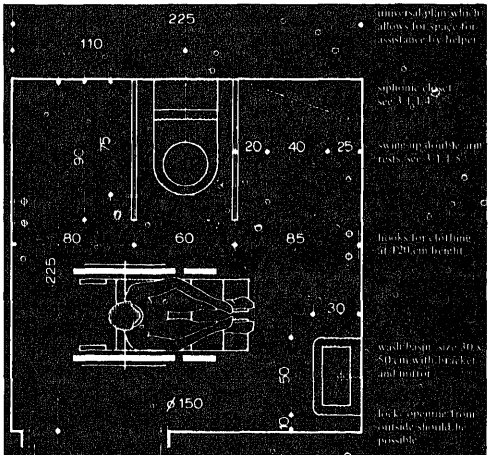
d. **WASHROOMS AND TOILETS.** Public washrooms and toilet rooms should permit easy passage of a wheelchair and allow the occupant to enter the stall, close the door, and transfer to the WC, from either a frontal or lateral position. It is advisable to mount one movable grab bar on both sides of the WC or one movable grab bar and one fixed to the adjacent wall. The public toilet should have basins; towel dispensers, mirrors, etc. mounted at a height that is usable by persons in wheelchairs. Turning space for the wheelchair should be provided when possible. For a possible request for assistance an alarm system is advisable.

e. **LIFTS (ELEVATORS).** Lifts should be large enough to carry at least one wheelchair passenger and an attendant. The clear width of the door opening should be as defined in point c. The control panel and an emergency system should be within reach of a seated person.

f. **PARKING AREAS.** Although automobiles vary in size from country to country, parking spaces reserved for handicapped drivers should allow sufficient clear space between parked cars to allow a driver to transfer to a wheelchair.

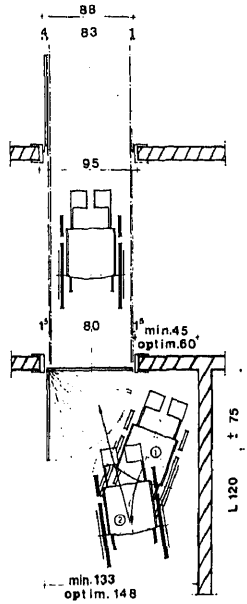
g. **GRADIENT OF RAMP.** Ramps should be avoided where possible. Where they are necessary, the slope of a ramp should not be too steep to prevent a person in a wheelchair from propelling himself independently. If the ramp is over 9 meters (about 30') long, it should have intermediate landings. Short ramps should not exceed 1:12, long ramps should preferably be 1:20 max.

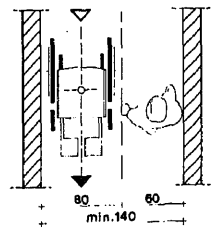
h. **HEIGHT ABOVE FLOOR OF SWITCHES AND CONTROLS.** Control panels, emergency systems, electric switches, door and window hardware that must be manipulated by hand be placed so that they are within reach of a person seated in a wheelchair. Hardware should be selected for easy use by handicapped persons.

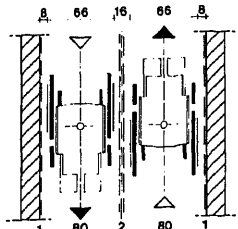


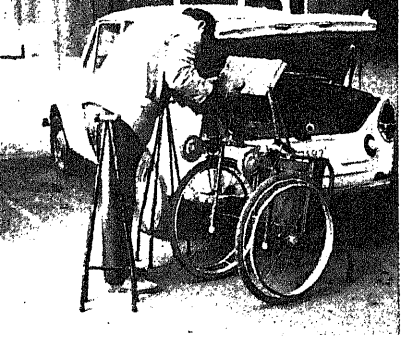
rchitectural Facilities for the Disabled).

Sample Corridor, passage for two wheelc









(photo credit: Red Cross Society, Belgium).

CITY GUIDES

Although there are undoubtedly many more, the following is a list of country and city guides to accessible facilities which have come to the attention of the Rehabilitation International Secretariat:

Australia: Adelaide and Sydney (*general guides*), New South Wales (Motels)

Canada: Toronto and Winnipeg, and a hotel and motel guide for Canada

France: "Voyager quand Même," (guide of France, includes hotels, restaurants, public buildings and public transportaion), 1974 Michelin Guide to France indicates accessible hotels and restaurants, Grenoble.

Federal Republic of Germany: Dortmund, Kiel, Koblens, Munchen.

Ireland: Dublin

Israel: Jerusalem

Netherlands: Guide of hotels, hostels, camping, train travel and city guides in Netherlands and other European countries, guide to rail travel in Netherlands.

Switzerland: Guide of accessible hotels in Switzerland

United Kingdom: Guides to most major cities have been published, also guide to underground stations, guide to access of public conveniences, guide to British rail, and Regional Tourist Board 1975 guides indicate accessible facilities.

Scotland: Edinburgh

United States: Guide of city guides in

0.025 m. (1") to allow passage of a wheelchair.

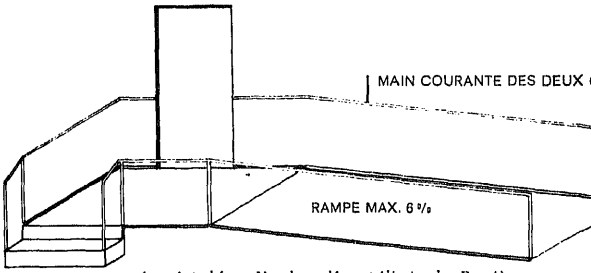
j. **HANDRAILS.** Handrails suitable for gripping can make it pos sible for persons with some mobility to navigate steps, ramps, etc They should be mounted 0.90 m. (ab. 3') above the floor.

k. **FLOORS.** Floor surfaces should be of non-skid material and of a texture to minimize resistance to the movement of a wheelchair.

25. The points discussed above refer to Annex 1. It should be noted that there are many more points which need be considered in rendering building and facilities accessible.

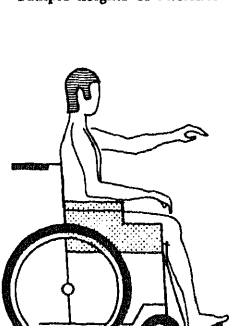
26. The expert group decided to stress the importance of the minimum performance standards, took note of the measurement given in Annex 1 and emphasized the fact that they should be considered by each country in the context of prevaling technical, economic and social conditions.

Sample ramp



(reprinted from Un plan adéquat élimine les Barrières Architecturales, Switzerland, see Bibliography).

Sample heights of switches

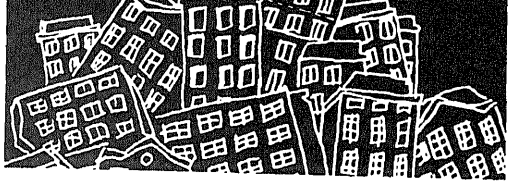


recommended height limits for switches an wall sockets: approx. 90 to 120 cm

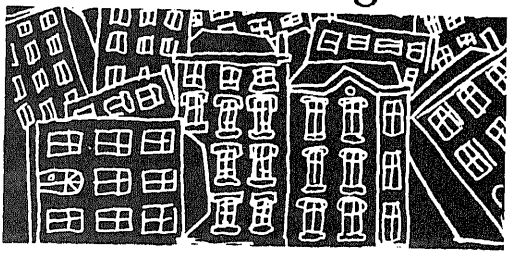
limiting dimensions for switches

limiting dimensions for wall sockets

(reprinted from Archit



IV Architectural Barriers in Housing



27. The subject covers the requirements in new constructions, which will permit disabled persons to live in appropriate living units (homes, apartments, etc.) and take part in social life, as far as housing is concerned. As for the accessibility to facilities, Chapter III applies.

28. The principle of *integration*, when applied to living arrangements for the disabled, requires a major shift of primary design criteria. *Design for housing* should be based upon full recognition of the human dignity deserved by the disabled individual just as much as the non-disabled for a realization of his self-worth. Immediate efforts are needed to begin to implement the goal of free choice for all handicapped persons by providing options for a variety of living arrangements. A re-organization of priorities is needed in planning alternate living arrangements for institutional living to which so many of the aged and handicapped populations of the world have been relegated.

29. With social norms changing throughout the world (particularly those related to the extended family concept) it is timely to consider providing *assistance in design criteria (techniques) to developing nations*. Also educational and promotional materials for dissemination to civic groups, professional organizations and institutions can be helpful in creating an awareness of the need and a better understanding of the concept of integration and special strategies to effect it for disabled persons. The involvement of handicapped individuals and self-help groups was urged in the planning process and distribution of such materials.

in itself, but as a means towards an end. The ultimate objective is that physically handicapped people should be enable to live meaningful and self-determined lives."

Selwyn Goldsmith
DESIGNING FOR THE DISABLED
United Kingdom



(photo credit: The New Zealand Society for Crippled Children

SUPPORTED LIVING ARRANGEMENTS FOR SEVERELY DISABLED PEOPLE

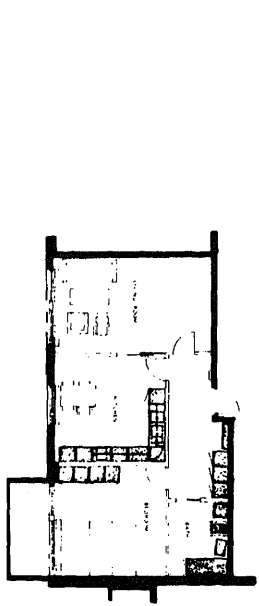
Sweden

In 1964 the Fokus Society was established to construct apartments and provide services for severely disabled people in living complexes built for the non-disabled in Sweden. The following is a summary of the Fokus project by Sven Olaf Brattgard, M.D., founder of the Society.

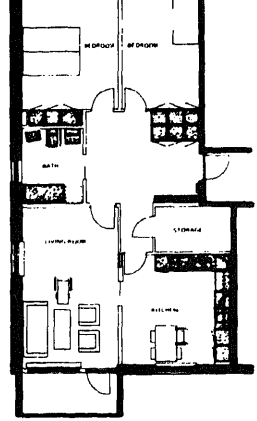
Design: **The Fokus project is based on the principle that disabled people have the same right as all others to a home of their own and that these homes should be integrated with those of the non-disabled. Flats provided by Fokus are primarily meant for severely disabled persons in need of night and day service—most of the 300 residents are wheelchair bound, 70% need help with dressing and going to the lavatory, 30% have to be fed and 25% have to be turned over in bed at night. The need for permanent access to service necessitates concentration of Fokus flats in one block or bulding so they can be reached easily by members of the service staff.**

Service: **In Sweden all urban and rural districts have communally employed home helpers who serve old, sick and disabled people. The disabled living in Fokus flats are also given this service, on an average of**

nately half of what the care of
ed person would cost in a
n clinic and two-thirds the
iving in a nursing home. All
in the Fokus flats come from
titutions or have had similar
heir parents' homes, a fact
learly demonstrates how
e the Fokus project is for
In Sweden, federal subsidy for
flats for the disabled is
e. If the Fokus resident has his
ome, he is required to pay
nately 20% of this for rent
ice; if he has no income, this is
the federal or local authorities
e Fokus Society. The invalid
also paid by the Swedish
ent, is used for food, clothing,
, entertainment, etc.—the main
e being that the costs incurred
lisabled person because of
bility should be compensated
ociety and the pension should
for those general expenses
ust pay, whether we are
or not.



FOKUS FLAT 2 Rooms and kitchen



FOKUS FLAT 3 Rooms and kitchen

(reprinted from Models of Service for Multihandicapped Adults, see Bibliography).

NG FOR
LED PEOPLE
Kingdom

r to establish a long-range
plan responsive to the housing
physically disabled people
ited Kingdom, a Working
this subject is studying the
legislative and other actions
hese needs. Among their
ndings are: (1) National
ound that an estimated
andicapped and impaired
ere in need of re-housing in
f the very severely and
handicapped, 56% were found
need of re-housing or
al improvement of existing
dation. (2) Between 1970 and
l authorities built or proposed
,403 dwellings for disabled
epresenting 1 dwelling per 595
f re-housing. (3) One of the
stablished units for the
ly ill has estimated that 50%
idents could be living in the
ty if the right support services

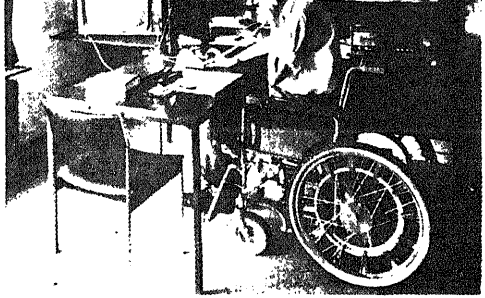
Conclusions

30. The integration of handicapped persons within the population should be an identified goal in private as well as public housing. In order to promote integration it is highly desirable that disabled as well as non-disabled persons can pay visits to each other and have free choice of their own living unit.

31. In order to permit people to pay each other a visit, new living units are recommended to be accessible. A living unit is considered to be accessible, when a visitor in a wheelchair can enter at least into the living room.

32. In order to promote free choice, new living units are recommended to be adaptable. It is noted that building codes exist in communities throughout the world, which provide a mechanism for encouraging the implementation for adaptable housing within the private sector.

33. A living unit is considered to be adaptable, when it is accessible and can be modified with comparatively little cost in a way consistent with permanent living requirements of wheelchair users. If their requirements are met, the unit is fully livable to most of the other



(photo credit: French National Liaison Committee for Rehabilitation).

34. The group recognized the importance of the problem of housing requirements of severely disabled persons and suggested that attention should be given to the availability of fully adapted living units to wheelchair users for individual as well as congregate living. For instance, *units on ground floors* and/or without barriers elsewhere in apartment buildings, construction of which has been subsidized by public funds, may be reserved for them. The specific requirements of various disability groups are discussed in the next chapter.

35. In order to ensure privacy and to diminish environmental stress in congregate housing, it was suggested that:

(i) the living units should each have an independent entrance;

(ii) the complex should be situated in a residential area;

(iii) the supporting facilities be made available also to other persons in the neighborhood.

Cambodian village



(photo credit: United Nations).

supported living arrangement for severely disabled people. Currently housing more than 400 disabled people, Het Dorp was planned as an integral part of an existing city—Arnhem—and as close as possible to a comprehensive rehabilitation facility—the Johanna Stichting Rehabilitation Center. The village was constructed with funds raised from the public and is operated with the financial assistance of federal and local governments. The following is a summary of a report by the founder of Het Dorp, Mr. A. Klopwijk.

Design: Every villager has his own home (entrance hall, bed-sitting room, cooking facilities, toilet, shower and washstand). For each row of 10 houses, there is a community center for socializing and a home for a non-uniformed trained helper. Married couples live in double houses converted from larger single homes.

Employment: Some inhabitants are employed in Arnhem and reach work by special transport, although most villagers are employed in Het Dorp's sheltered workshops.

ARCHITECTURAL BARRIERS IN DEVELOPING COUNTRIES

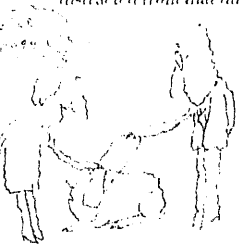
"For us in Africa, and the developing countries, we cannot afford a special housing program with details of window heights, corridor widths, etc. What we would, perhaps, require is the cooperation of medical and social authorities, architects, townplanners and engineers to insure that information on housing for the disabled is made available and capable of application to normal housing...

"The developing countries are in a particularly fortunate situation in that most of their public buildings are in the planning stages and they would be well advised to incorporate such ideas as barrier-free design. By so doing, they would avoid the high cost of future modifications—But, such incorporation will be made only when the planning authority is made aware of the trends in social rehabilitation of the disabled."

J. Amouko, Ghana, PROCEEDINGS of the 12th World Congress of Rehabilitation International, Sydney, Australia, 1972.



As tempting as it may be to pet a dog guide, remember that this dog is responsible for leading a master who cannot see. The dog should never be distracted from that duty.



Speak directly to a blind person, not through a third party. Interpretation is not necessary since blindness is not a separate language.



Go ahead and use words like "see" and "look." You can't avoid them ymore than a blind person can because there just aren't any reasonable substitutes.



V Architectural Barriers Affecting Special Groups of the Disabled

36. Three characteristics of the man-made environment that usually receive little if any attention but which affect the quality of life for all and do so in a critical way for the handicapped are observed to be:

(i) the provision of personal space and protection of territoriality of the occupant of that space;

(ii) the avoidance of ambiguity in space, that is those characteristics that deceive the mind into thinking that the space is different in size, shape or relation to other spaces from what it is in fact;

(iii) the desirability of cues as to one's orientation achievable by design of environments which are differentiated from other proximate spaces by size, shape, form, materials, texture, colour and detail and which do not rely only on the essentially prosthetic application of colour or graphical cues as to location, as desirable as these latter features are to reinforce basic design differentiation.

37 These characteristics are fundamental to more detailed features required in facilities built especially for the mentally retarded, cerebral palsied, epileptic and confused elderly to protect individual dignity, enhance the knowledge of self and self-worth and to foster maximum human development.

38. There are two approaches to the integration of the handicapped in all of societal functions: (a) adapt the handicapped to the environment, (b) modify the environment to the acceptance of the handicapped.

39. While the latter course was the particular theme of the meeting,

design are found in use with these groups.

Neurological and Developmental Disorders

40. The extent of disability in intellectual dysfunction, neuro-motor handicap or seizure incidence and prevalence may extend from very mild to extremely severe in any one or all three of these areas simultaneously. An accessible man-made environment is believed to be one which in most respects would be generally acceptable to the physically handicapped as a whole group except that attention should be given to three particular areas:

(i) water closet enclosures should be large enough to accommodate the presence of an aide to assist in transfer, etc;

(ii) the location of telephone (coin slot), towel racks, drinking cups, trash containers, elevator call buttons, elevator alarm buttons, elevator emergency phones, thermostats, fire alarm boxes, soap dishes, electric wall outlets, etc. should be within the more limited range of reach of this group;

(iii) door hardware, lavatory fittings, tub or shower fittings, kitchen sink fitting and like devices that require a grasp and turn operation may be impossible for some in this group; such fittings are available with lever type operation requiring only a gross motor movement up or down to actuate, and these are preferred.

Hard of hearing and deaf

41. Visual (lighted) signs should supplement all circumstances wherein directions, signals or alarms are given by auditory means. Some alarms should be given by appropriately placed blinking lights.

42. Technology exists for simple short distance radio communication within theaters, churches and like places of assembly and recreation which depend, for satisfaction, on the receiving of a clear audible signal. The receiver portion of the system can be adjusted to the appropriate level for each hard of hearing user. This is common provision in Sweden. Elsewhere, hearing devices wired to special rows of seats are often provided.

43. Attention should be paid to elimination of as much distracting background noise as is possible so that interference with amplification in hearing aids does not confuse and distract the user.

Visually impaired and blind

44. Auditory signals should signal the floor stops of elevators (these can be verbal) and the change of signal lights at crossings and



"Sound can have both positive and negative effects for people with impared vision. As an echo from a footstep or a stick, sound has a positive effect and acts as a complement to their acoustic signals. Certain continuous sounds, such as those of an escalator or a fountain, can also make orientation easier.

Sound has a negative effect when, as noise, it distorts or blocks desirable sound. Noise is 'mist' to the blind. Wind has both a dampening and distorting effect. Sources of noise should be screened so that they do not disturb sounds which can give directional guidance."

THE PHYSICAL ENVIRONMENT AND THE VISUALLY IMPAIRED, International Center for Technical Aids, Housing and Transportation

ARCHITECTURE AND MENTAL RETARDATION

"... the challenge to the architect in developing residential buildings is to create a type of environmental pattern that facilitate group living and yet provides space to which the individual mentally retarded resident can relate himself in a meaningful way.

The location of a building can be of crucial significance and ... furthermore, the very question of whether we should plan *a* facility or *several* facilities, and within the facilities a single building or a variety of buildings, should again be predicated in part on new architectural knowledge of building design, building materials and construction methods which allow us far greater choice than in past years. It is this basic contribution architecture can make which requires that this profession be represented from the very beginning in the planning activity.

Finally, reference must be made to ... the excessive cost of these new types of buildings. First of all, I hope that we will now increasingly accumulate facts and figures comparing the costs of the kinds of buildings we ought to have with the kind of buildings we are still required to build. I think we are going to find that the kind of buildings we ought to have for a large number of our residents can be built at a substantially more economic cost than the present standard type hospital structures."

Gunnar Dybwad
ARCHITECTURAL
PRINCIPLES AND
MENTAL RETARDATION



45. Unexpected or hazardous obstacles which might be encountere by the blind without warning by search of the walking stick c cane along the ground or floor in the path of travel should be avoide or eliminated.

46. Tactile indications of elevator buttons should be placed adjace to these buttons.

47. The emergency alarm button in elevators should be differe from other buttons with a different tactile coding on its face.

48. Room numbers with or without names as found in office buil ings, hotels and the like should use raised or recessed figures an letters for easy identification by the blind.

49. Guide or seeing eye dogs required by the blind should be allowe entrance to buildings and public transport systems within appr priate local criteria.

Elderly

50. The elderly face a decline of their physical, emotional and ment coping abilities. To remain functional as long as possible the abilities must be taxed as lightly as possible. While design of the places of habitation should be given special attention to assure safe and livability, the requirements of this group are wholly consiste with those of other previously identified groups in so far as access bility is concerned.

51. *Parks* and recreation areas attract increasing numbers of t elderly. Attention should be paid to accessibility of park are and the safety and interests of the elderly in their design.

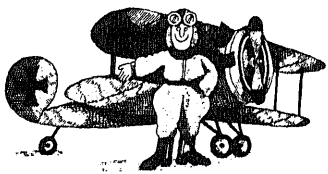
The special groups in general

52. There is a risk to life or to limb in the participation of the hand capped in the open society. While risks should not be foolish ventured or needlessly imposed, the right to risk is basic to the rig to participate in the hope of achievement of a rich and fulfilling lif Each society should so construct its facilities as to avoid needle risks to the whole population, the handicapped included, but not segregate the handicapped under the misguided impression that th is needed for them at the expense of their independenc.

53. Handicapped people may elect to be closely associated one wi another in special programmes or in housing or other ways achieve the benefits of special services. There is an inevitable co

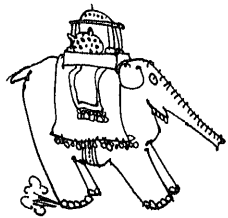
The principal disabling conditions and their effect on mobility

	Disabling conditions	Effect on mobility	Comments
Degenerative conditions associated with ageing	1 Heart and respiratory conditions	People with these conditions should avoid sudden stress or prolonged exertion. They are not able to climb flights of stairs, gradients or steep ramps, or walk long distances. They are not unsteady	These conditions are found principally among the elderly. People suffering from them account for a large proportion of the disabled population. Amputation may be associated with trauma in young people, especially in time of war, but the majority now patients attending limb centres in Brit now are elderly, and their amputations are the result of disease rather than trauma[1]
	2 Arthritis	People with arthritis have very stiff joints, and move slowly, painfully and unsteadily. They have difficulty in climbing high steps and kerbs, and in negotiating steep gradients	
	3 Hemiplegia	Hemiplegia involves varying degrees of paralysis usually of one side of the body. Most hemiplegics walk with difficulty, and unsteadily. Many use sticks and callipers. Those in wheelchairs are not as a rule able to propel themselves because of the one sided paralysis, although the use of an electric wheelchair would solve this problem	
	4 Amputation	Amputation of the leg may result in some unsteadiness especially on gradients	
Hereditary and congenital conditions	5 Epilepsy	Epileptics have normal mobility, but are often afraid of having convulsions and falling in lifts or on winding staircases	These hereditary and congenital condition are found in children and young people principally. They are comparatively rare, but the number of babies surviving the fir critical years of life with these conditions is increasing.
	6 Bleeding disorders such as Haemophilia	People with these conditions should avoid undue energy expenditure and should not be bumped or jolted. Some need to use a wheelchair	
	7 Cerebral Palsy	The different types of cerebral palsy may result in weakness, poor balance, or wild unco-ordinated movement	
	8 Spina Bifida	Spina Bifida may result in complete or partial paralysis of the lower limbs resulting in difficulty and unsteadiness in walking, and sometimes inability to walk at all. Incontinence is also a major problem associated with this condition	
	9 Muscular Dystrophies	Dystrophy is muscle wasting sometimes involving paralysis. A wheelchair eventually becomes essential	
	10 Congenital limblessness	People moving on artificial limbs are usually rather unsteady, especially on slopes. Artificial arms and hands are never entirely effective and people using them may have difficulty with doors and grip rails	
Disease and damage to the nervous system	11 Parkinsonism and other disorders involving voluntary movements	People with Parkinsonism have a jerky and uncontrolled gait, and are unsteady; handrails are very helpful to them	Apart from Parkinsonism, which is most common among old people, these conditions occur mainly in children and young adults
	12 Disseminating Sclerosis (including Multiple Sclerosis)	Sclerosis causes paralysis of muscles and disorders of balance and vision. A wheelchair may eventually become necessary	
	13 Poliomyelitis	Polio can cause wasting and paralysis of the limbs. This may result in unsteadiness especially	



"The greatest hurdle is to convince the operators and manufacturers of mass transportation vehicles that by meeting the needs of the handicapped, they will be providing a superior, safer and more convenient service for everyone."

Edward H. Noakes
PERFORMANCE, magazine of the U.S. President's Committee on Employment of the Handicapped

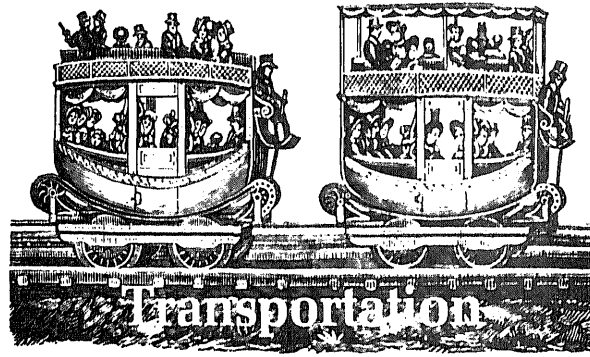


GOOD DESIGN PRINCIPLES RESULT IN ACCESS FOR ALL

Norway

The underground railway system in Oslo, Norway is generally accessible to the disabled because the architectural planning principles utilized were sufficiently liberal to encompass the minimal requirements of barrier-free design. Ramps of generous dimension, intended for the entire traveling public, are a feature of all station buildings. Large entrance doors to the cars, which easily accommodate wheelchairs were planned to increase efficiency of flow of all passengers. Interior space of cars is also liberal (width 3.2 meters and length 17 meters), which further facilitates wheelchair access on this subway system. Although the original plans for the subway in 1954 were completed without specific consideration of *handicapped travelers*, current plans

VI Barriers Impeding the Disabled in the Use of Means of Transportation



54. The integration of handicapped people is greatly limited by their insufficient mobility. Although private transport, as specially equipped cars, is available to some, only a minority of the handicapped can benefit from that type of transport which anyway cannot completely replace the public transportation. Therefore, public transportation for the handicapped is a real need and it was suggested that everybody has a right to public transportation.

55. If this statement is properly observed, it would result in greatly improved public transportation facilities for all the groups which encounter difficulties in using them, e.g. the *aged, handicapped,* parents with *perambulators,* etc. It was suggested that everybody in general would profit from improved design and improved services.

56. Architectural and constructional barriers should be eliminated and attention should also be paid to psychological, social and financial barriers.

57. For accessibility of and performance requirements for the buildings used in connection with public transportation, reference is made to Chapter III. This applies as well to transportation support

58. It was recognized that there are certain biases, technological problems and administrative restrictions that prevent a number of disabled persons from using the means of public transportation or make it unreasonably difficult to them, e.g. non-acceptance of certain categories of the disabled onto airplanes, prohibition of taking along acid batteries used in electric wheelchairs, prohibition of taking along wheelchairs or guide dog, etc. Attention should be paid to elimination of these and other similar problems.

59. As a principle, disabled persons should, if they so choose, have the possibility of utilizing public transportation even in rush hours.

Trains

60. The design of most of the existing trains (except for some metro systems) causes great difficulty for handicapped people, especially for wheelchair-users. There is usually a great gap between the platform of the station and the entrance of the *train*. In many systems, the doors are far too narrow. At least one compartment per a set of cars should be fully accessible with sufficient room for wheelchairs to turn around. It is desirable that an adapted washroom/toilet were available. This is essential in long-distance trains in which there should also be adapted restaurant facilities and a suitable compartment in the sleeping cars. The functional requirements should conform to the size of the wheelchairs commonly in use.



Buses and trams

61. The buses used presently in public transportation give no access to wheelchair bound persons nor is their construction favourable to other handicapped persons with walking and gripping difficulties. Raised platforms could bring some improvement to them. New models have to be developed which can meet their demands. In some countries, new constructions are being tested. Whether these can meet all



(photo credit: Netherlands So Rehabilitation).

ACTION AT PLANNING STAGE OF SUBWAY SYSTEM

Hong Kong

Action at the planning stage of a proposed mass transit subway system has been taken by the Joint Council for the Physically & Mentally Disabled of Hong Kong. Learning in 1972 of the Government's plans to build the subway, the Joint Council convinced the authorities to include the traveling needs of disabled people in its transport survey and is coordinating a concerted effort by all concerned voluntary organizations to further negotiate this issue.

ADAPTATION OF RAIL TRANSPORTATION

The Netherlands

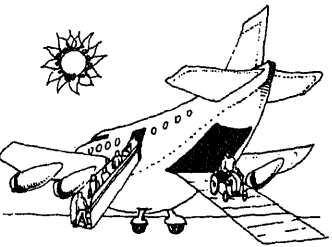
In the Netherlands, use of the public railway system by physically disabled people is made difficult by the difference in levels of the doors to the railcars and the level of the approach platform to the train. There is also a gap of approximately 50 centimeters between the platform and train. A portable ramp, which after several years of experimentation, has proven successful in overcoming these differences, is here illustrated.

Most of the railcar entrances have double doors, blocked by a center bar. On each train, however, the center bars are eliminated at one entrance to give access to the wheelchair user.

Dutch railways have a special telephone number enabling assistance to be given at most stations, if applied for 48 hours in advance. Free travel is provided for the escorts of handicapped people who cannot travel without assistance.

The Netherlands Society for Rehabilitation is in close consultation

Major airports in Australia are noted for their barrier-free design and in 1972 the Department of Civil Aviation was presented one of the first "Awards for Access," by Rehabilitation International.



(Netherlands Society for Rehabilitation).

A report on "The Conversion of Cars for Disabled Drivers" was published by and is available from the International Center on Technical Aids, Housing and Transportation, (ICTA) Bromma, Sweden.

"It's remarkable how many taxi drivers develop heart conditions whenever they see a handicapped client."

THE NEEDS OF THE DISABLED IN RELATION TO FUTURE PROGRAM DEVELOPMENT Canadian Rehabilitation Council for the Disabled

In **Argentina, Denmark,** and **Ireland,** the Symbol of Access is recognized as an identification emblem for disabled drivers, which, in most cases, entitles the drivers to extended privileges.

63. There should be sufficient space and appropriate sanitary facilities for wheelchair users in planes and ships. There is no uniformity regarding the rules for allowing the handicapped unrestricted use of the air transportation. This should be developed.

Taxis

64. Taxis offer a convenient mode of transportation to the handicapped, except that they, in general, cannot accommodate non-collapsible wheelchairs. Also, the drivers are often reluctant to give the proper assistance. Especially for larger companies engaged in this transport, it is recommended that they have some taxis which are adapted for use by handicapped people. Discussions should be started with the owners of taxi fleets and with organiaztions of the drivers to ask for their contribution in improving the mobility of handicapped people.

Private transportation

65. For working wheelchair users who need a car to come to their place of work, a car should be considered as one of devices to achieve the goal of total rehabilitation.



Adapted bus in use in the United States.

66. Special attention should be paid to the following aspects concerning the private transportation of the disabled:

—where possible such financial barriers as direct and indirect taxes connected with the purchase and running of a car should be avoided;

—special parking places should be reserved near the homes, places of employment, public buildings and recreational facilities;

—exemptions from parking regulations valid throughout the country should be made available;

—driving in areas which are closed for normal traffic should be permitted to the disabled.

67. As regards these items, the criteria as to who are eligible to use these facilities should be established. The special parking places and the exemptions from regulations for parking and driving should be such that these are made irrespective of the fact whether the handicapped is the driver or the passenger. Criteria should be as uniform

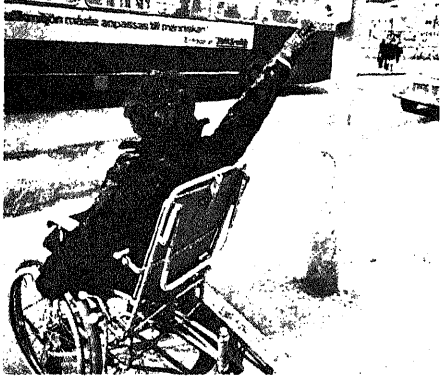


photo credit: Swedish Central Committee for Rehabilitation

Recommendations

68. The following guidelines were recommended to be internationally accepted:

a. facilities and equipment usually connected with public transport system should be accessible to physically handicapped as well as non-handicapped;

b. in designing new buildings and vehicles for use in public transportation, special attention should be given to the requirements of the handicapped;

c. adaptation of existing buildings and vehicles should be carried out in order to meet the principle of accessibility and usability;

d. where adaptation of existing buildings and vehicles used for public transportation is impossible or cannot be attained within a reasonable time, alternative specialized transport should be provided at the price to the disabled not exceeding the price of normal public transportation;

e. consideration should be given to the transfer from one means of transport to another, so that an integrated system can be developed securing the coverage of the complete distance required to reach the destination;

f. telephones and other commonly used fixtures and appliances at stations, terminals, etc. should be reachable from the wheelchair;

g. necessary steps need be taken to assure the safety of handicapped passengers (i.e. possibility of fastening or locking the wheelchair);

h. there should be reserved seats for the handicapped in buses, trams and trains which could be occupied by others if not used by the former;

THE PHYSICALLY HANDICAPPED AND PUBLIC TRANSPORTATION IN FRANCE

Adaptation of conveyances– (a) *National Railways.* **Modification of current equipment to provde accessibility on the level of the rail coach is considered too expensive, however it is planned to equip new stations with ramps or hoists. (b)** *Urban Transportation Conveyances.* **At present, in the city subway system, approximately 30% of the stations are equipped with elevator units intended for all passengers and moving sidewalks are in operation in several stations. New lines of the regional subway are equipped with escalators, making possible the entire trip from ground to platform. Hoisting units are generally available, although certain of the larger regional stations are not so equipped. The newer stations and railcars have widened doorways, better arrangement of support railings and reduction of depth of steps leading to platforms.**

Accessibility of France's urban bus system has been facilitated by the newly adopted specifications which feature a lowered floor, more numerous doors and more convenient steps. Special bus circuits for handicapped passengers are organized by the transportation companies for collection of passengers at schools and businesses.

In addition, associations of handicapped persons also have their own special services.

Facilities provided to the handicapped in conveyances– (a) the *Paris transportation authority* **allows free transport or fare reduction exclusively to disabled war veterans, blind civilians, persons with both hands amputated and to the guides accompanying certain invalids. In addition, he may be entitled to other priorities, e.g. the right to travel first class on city and regional subways with a second class permit.**

(b) *National Railways.* **In addition to granting the above privileges, free transportation in second class to a person or dog serving as a guide to a blind person can be issued. For an extra charge, handicapped persons**

VII Legislation Concerning Architectural and Other Environmental Barriers



ideal future, the human every individual will be d by a society of people whose n and maturity of attitude minated all forms of prejudice rimination, and assured equal ity for all.
ion towards that ideal owever, be left to chance– depend on laws to protect ghts and on administrative sms to insure that the values in the laws are promoted and, ary, enforced."

nan Acton
etary General
abilitation International

the following clause was the Building Code of Sweden: ildings those parts to which al public is admitted or that e working places shall be , as far as reasonable, in a making them accessible and r persons who motor ability of orientation is restricted by

70. The enactment of legislation or other legal action by a government is only one of several means to be used to help achieve a barrier-free environment.[6] Preferably legislation should be enacted after community or country surveys have been made so that essential pertinent facts are known, and after the citizens and all elements of leadership of the community are aware of and generally in agreement on what should be in the law. In the interest of educating public opinion, the developing countries may need advice on mobilizing a campaign of public information, and short term legislation may be needed to begin the process of policy determination and action. In still other countries it may be preferable for an official or unofficial commission to be appointed to gather information and study the problem. In this instance, the enactment of specific legislation or provision for a building code might be a result of the comprehensive consideration of the issues by the commission.

71. In any event, it is important that legislation be viewed as only one of several means that may be brought to bear in the process of achieving a better environment that is most accommodating to the needs of all people, especially the disabled. Other sources and procedures should also be used such as surveys of existing buildings, public facilities and habitable spaces (such as parks), with regard to the need of disabled people.

72. Another important element is to have full discussion of any proposed legislation by key sectors of the population. This includes the disabled themselves, medical and rehabilitation experts, financial

execution.



The substance of legislation

73. Specific provisions in the legislation should grow out of a country's own sense of values and needs. Other nations' laws can be adapted, but not copied in detail.

74. Several principles regarding the substance of legislation can be identified:

(i) It should contain all necessary mandates with respect to enforcement, including penalties for non-compliance and/or benefits to be derived from prompt voluntary adherence to a law which might provide for gradual compliance;

(ii) It should contain provisions for periodic evaluation and reassessment of the law, and the total environment which has or has not been affected by the existence of the law;

(iii) The law should contain some authorization for involvement of groups of disabled people in planning and evaluating the effectiveness of the enactment, possibly including financial help to enable such groups to plan for or judge the effects of other people's planning with regards to the real needs of disabled people;

(iv) The legislation should, as a minimum, establish the framework for local mechanisms to achieve the objective of barrier-free architecture, possibly in terms of performance rather than specific quantitative measurements;

(v) The law should provide for an on-going critical review of performance under the law and necessary follow-up with respect to specific buildings;

(vi) Where possible, the law should identify minimum objectives to be reached by local authorities;

(vii) In developing countries, the legislation or offical action might well be less specific in detail because of the difficulty in implementing complex provisions involving employment of inspectors and paying for other compliance mechanisms.

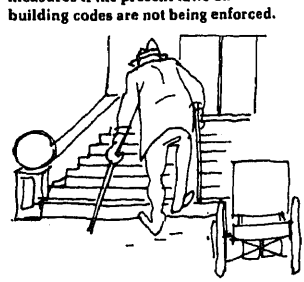
75. It is noted that the legislation referred to in the foregoing observations and recommendations deals with forestalling or eliminating environmental barriers in all kinds of structures and facilities. Legislation specifically mandating the provisions of housing or transportation services and subsidies or loans to modify structure and facilities as such is not dealt with here, but might be the subject of other United Nations papers and recommendations.

bibliography Annex.

Australia: "Design for Access by Handicapped Persons, Part I–Public Buildings and Facilities," was published in 1968 by the Australian Standards Association, the authority for standards for buildings, furniture and equipment. Although the Standard has not been adopted by law, the government authorities throughout the nation have agreed to incorporate the recommendations in all buildings erected by those authorities, and, according to the Australian Council for the Disabled, this is taking place. ACROD, through its National Committee on Access, coordinates the state activities on barrier-free design, which have included major public education campaigns and the publication of many urban guides to accessible facilities.

Czechoslovakia: Reports from the Federation of Czechoslavakian Invalids confirm that following an informational campaign on architectural barriers, the Government passed legislation in 1971 requiring that all newly-constructed buildings related to preventive medicine, rehabilitation and social services be accessible to the physically handicapped.

Iran: A review of existing legislation on this topic was begun in 1974 by the National Iranian Society for Rehabilitation of the Disabled, with the objective of the proposal of new measures if the present laws on building codes are not being enforced.



Israel: The National Planning and Building Act of 1965 has been amended and now requires that not only must all new public buildings be barrier-free, but also any structural changes in existing buildings must encompass the minimal requirements of accessiblity for the disabled. The



VIII Conclusions and Recommendations

(photo credit: Invalidens, Fin

76. On the basis of the discussions that took place on the preceding items, the meeting agreed on the following conclusions:

(a) Disabled persons have a **right to access** and use of structures intended for general public use and public systems of transport and to choices in their selection of dwelling spaces.

(b) An important reason for eliminating environmental barriers and developing usable buildings and facilities is to prevent **unnecessary segregation** of older and disabled people and their premature relegation by society to less mobile living.

(c) Buildings, habitable spaces and transportation systems usually can be designed to accommodate disabled people without complicated or expensive devices or **modification of standard design.**

(d) The rehabilitation of disabled people and their successful return to active work and living depend upon their being prepared to return to the community equipped with necessary **personal appliances** and upon the existence of a **barrier-free environment** which they can manage.

achieved most easily and promptly only with the joint **co-operation** of governments and private leaders, including professionals such as architects, health workers and other community leaders as well as disabled people.

g) Further research be undertaken on the following items in particular:

(i) on the possibility of introducing in practice the principles of accessibility and adaptability through **town planning,** designing of new types of houses and **technical improvements,** and/or adopting of appropriate **building standards**;

(ii) what intermediate solutions could be achieved, i.e. in **adapting existing buildings** and facilities to the requirements of handicapped persons;

(iii) making the **public transportation system** usable by the handicapped, i.e. through eliminating discriminatory regulations, designing accessible rolling stock and developing accessories to make existing vehicles usable;

(iv) the role of social and **psychological barriers** and how to cope with them;

(i) While the concept of Human Rights was stressed throughout the meeting and there was complete accord with the fact that the disabled have a basic right to share in the resources afforded to all citizens, the participants recognized the problems faced by **developing countries** where cultural and social differences as well as economic limitations will affect the practical implementation of these rights.

77. Finally, the meeting decided, in addition to the specific recommendations appearing in the preceding chapters, to further *recommend* that

a) The United Nations and other interested organizations consider ways for

(i) promoting international **guidelines** affecting policies on barrier-free design;

(ii) **stimulating** and co-ordinating the work that is being done in this field;

(iii) allocating funds for a **clearing house** of information specializing in barrier-free design of buildings and facilities;

(iv) promoting **research** on architectural and other physical barriers and on their elimination;

(v) following up the **implementation** of the recommendations of the meeting;

(vi) **assisting developing** countries which wish to know why and how to make their buildings and facilities free of impediments to handicapped people.

b) The 1976 United Nations Conference **Exposition on Human Settlements** include examples of barrier-free design and consider the ideas and recommendations expressed by this meeting in selecting the model communities to be included in its programme.

c) The principles and goals as stipulated in this report be effectively supported through the **education of the design profession** (architects, landscape architects and engineers) on the needs of the disabled with respect to architectural and environmental barriers and on how to meet those needs.

d) The **curricula of schools** training the design,

e) The **International Organization for Standardization** be requested to consider the need for international standards and criteria for hardware and equipment as well as for facilities relevant to the needs of the handicapped in the light of the recommendations contained in this report.

f) The institutions, particularly those providing domiciliary care, consider ways and means by which more emphasis could be placed on the **quality of life** and the needs of the individual rather than the administrative aspects.

(g) Barrier-free environments make it possible for greater numbers of people to become and remain **economically and socially independent** instead of dependent upon help from their families and social assistance programmes.

(h) **Legislation** alone cannot assure a barrier-free environment but can help to achieve it.

i) The special facilities for the handicapped be marked with the **Symbol of Access** (adopted by the Assembly of Rehabilitation International in 1969 in Dublin, Ireland).

SYMBOL OF ACCESS



THE SYMBOL OF ACCESS was adopted by Rehabilitation

Accessibility for Disabled Persons – Norms in Different Countries

All measurements in meters. 1 inch = 0.025. 1 foot = 0.33.
Measurement of WC-Room and Liftcar refer to width x depth

Country	Width of Walk (Path)[1]	Width of Corridor[1]	Free Width of Doors	Measurements of WC-Room	Measurements of Liftcar, Door-Width of Liftcar	Width of Parking Area	Inclination of Ramp	Height Above Floor of Switches and Controls
Belgium	–	2.00	0.86, 0.90	1.80 x 2.10	1.20 x 1.50 0.86, 0.90	3.30, 3.60	1:20	–
Canada	ca 1.65	–	0.81	ca 1.60 x 2.80	–	ca 4.00	1.12	–
Denmark[2]	1.30	1.30 (1.40)	0.83	2.20 x 1.80	1.10 x 1.20 0.83	3.50	1:12	0.90-1.20
Federal Rep. of Germany	1.20	1.40	0.85	1.80 x 2.00 2.20 x 2.00	1.10 x 1.40 0.80, 0.85	3.50	1:10, 1:16	1.05
Finland[2]	1.30 (1.50)	1.30	0.80, 0.90	–	–	3.40	1:12 (1:14)	0.90-1.20
France	1.50	1.20, 1.50, 1.60	0.80	2.10 x 2.17	0.80 x 1.30, 1.20 x 1.50 0.80	3.30	1:20	1.00-1.40
German Democratic Republic	–	1.80	0.83	1.62 x 1.80	–	–	1:12.5	–
Great Britain	–	1.22	0.785	1.37 x 1.75, 1.52 x 1.675	1.345 x 1.125, 1.07 x 1.455, 1.75 x 1.09 0.835, 0.91	–	1:12	0.91, 1.07, 1.37
Ireland	1.22	1.22	0.785	1.52 x 1.75	1.07 x 1.455 0.835	–	1:12	1.07
Israel	–	1.50	0.80	1.40 x 1.75, 2.40 x 1.30	1.07 x 1.46 0.84	3.00	1:10, 1:12	1.30
Italy	1.50	1.50	0.85, 0.90	1.80 x 1.80	1.70 x 1.50 0.90	3.00	1:12	0.90
Netherlands	1.30	1.10	0.85, 0.90	1.55 x 2.25, 1.90 x 1.90, 2.25 x 2.25	1.10 x 1.40 0.80	3.50, 3.60	1:12, 1.20	1.00
New Zealand	1.22	1.22	0.785	1.52 x 1.75 1.37 x 1.83	1.37 x 1.83	3.05	1:12	1.14
Poland[3]	1.50	–	0.85, 0.90	1.55 x 2.25, 1.90 x 1.90 2.25 x 2.25	1.10 x 1.50 0.90	3.60	1:8[4]	0.90
Sweden[2]	1.30	1.30	0.75, 0.80	2.10 x 1.40, 1.70 x 1.70, 2.20 x 1.70	1.10 x 1.40 0.80	3.60	1:12	0.90-1.20
Switzerland	–	–	0.80	1.50 x 1.50	1.10 x 1.40 0.80	3.50	1:17	0.90
United States of America[5]	1.22	1.05	0.80	1.65 x 2.00	1.65 x 1.65	3.80	1:12	1.20

2 PRIVATE TRANSPORT

2.1 Cars in housing areas

re there garages adjacent to any special
ousing for disabled people, or connected
the house by a covered way?

e setting down points not more than
) yards (45 m) from any special housing for
sabled people?

e there accessible means of vertical
rculation where garages are provided
neath housing, i.e. lifts or short ramps?

2.2 Parking in Town Centres

e there parking spaces in town centre
velopments within 50 yards (45 m) of
iority destinations and linked to these
stinations by convenient and accessible
utes?

there a reserved parking space for disabled
vers in each town centre multistorey car
rk, and are these places adjacent to the
eans of vertical circulation?

here stairs are the only means of vertical
culation in multistorey car parks are
served places for disabled drivers on the
me level as pedestrian routes?

as sufficient room been allowed in
served spaces for disabled drivers to
able the drivers to transfer from car to
heelchair?

there some means of preventing able-
odied drivers from occupying spaces
served for disabled drivers?

e kerbs within the garage or parking area
pt to a minimum of 4 in (102 mm)
d are ramped kerbs provided where there
e reserved parking places?

3 PUBLIC TRANSPORT

3.1 Train services

ave the needs of disabled passengers,
oth ambulant and wheelchair users,
en considered in the design of terminal
uildings and railway stations?
Parking and setting down points, minimal
edestrian distances, through route sign-
osting, vertical circulation, accessible

4.3.2 Bus Services

Have the needs of wheelchair users been considered in situations where railways have closed and buses have become the only means of transport?

Are town centre bus stops sited next to convenient access points to pedestrian circulation and to vertical access points?

Have adequate shelters and some seating been provided at bus stops most likely to be used by disabled people?

Are bus stations accessible to ambulant disabled people?

4.3.3. Transportation in the future

Do new forms of public transport provide good access and level loading for disabled people, and if so are their setting down points and terminal buildings accessible?

Where public transport is unsuitable for disabled people is there a convenient alternative available to them?

4.4 PEDESTRIAN ROUTES

4.4.1 Road crossings

Where road crossings are unavoidable have kerbs been ramped so that they are negotiable by wheelchair users?

Is there three foot width of level pavement behind ramped kerbs to allow safe passage along the pavement for wheelchairs and ambulant people?

4.4.2 Underpasses

Do underpasses have ramps of preferred dimensions and alternative flights of steps?

4.4.3 Footbridges

Are footbridges over roadways negotiable by disabled people, e.g. not stepped ramps?

4.4.4 Pedestrian distances

What is the distance from the priority destinations listed in Figure 4.4.4 to the nearest accessible parking place? (50 yards (45 m) maximum.)

What is the distance from the priority destinations to the nearest accessible bus

Where systems of short distance low speed transport have been incorporated into a development are they usable by disabled people?

4.4.5 Ground surfaces

Is the ground surface of all pedestrian ways of non-slip material?

Is the ground surface free of any irregularities?

4.4.6 Protection from the weather

Is there protection from the cold and wet on all key pedestrian ways?

Is there cover at all waiting places?

4.4.7 Crowding

Has due consideration been given to the width of pedestrian ways to safeguard against crowding?

4.4.8 Signposting

Are accessible routes for disabled people through a central area adequately and consistently signposted?

Is there adequate signposting to all special facilities for disabled people?

Are changes in level clearly indicated?

4.4.9 Resting places

Are there seats along all pedestrian routes and are these seats high enough for use by people with stiff hips?

4.4.10 Street furniture

Are there good lighting conditions on all pedestrian routes?

Are bollards, lamp-posts, etc., positioned so that they do not obstruct the passage of a wheelchair along pavements?

4.5 VERTICAL CIRCULATION

4.5.1 Ramps

Where ramps are provided, is there an alternative staircase for the convenience of the ambulant disabled?

4.5.2 Steps

Are there handrails on both sides of all flights of steps, and are these handrails

4.5.3 Lifts

Are all lifts of adequate dimensio
wheelchairs?

Where lifts in public buildings are
accessible means of vertical circu
disabled people, are they availabl
public throughout the day and ev

Are all mezzanine and intermedia
used by the public in multistorey
complexes accessible by passeng

4.5.4 Escalators and moving

Is there a convenient lift as an alt
means of vertical circulation to es
and moving platforms?

4.6 SPECIAL PROVISION FO
DISABLED PEOPLE IN PUBL
PLACES

4.6.1 Cloakroom and WC Cub

Are there accessible washing faci
and a special WC cubicle for whe
users in all public areas: shoppin
multi-level garages, motorway se
railway stations, airports, recreatic

Are public WCs accessible to amb
disabled people, i.e. approach fre
steps?

Is there special provision to aid a
disabled people in some public W
cubicles? (Higher WC seats, grip

4.6.2 Public Telephones

Are there telephones with acousti
hoods or some other type conven
for disabled people in all public a
Are telephone receivers within rea
chairbound person?

4.6.3 Fire Escapes

Has provision been made for disa
people to escape to safety in case

4.7 INDIVIDUAL BUILDINGS

4.7.1 Entrances

Do all buildings used by the publi
at least one entrance which is acc
to wheelchair users and the ambu

INTERNATIONAL

ACCESSIBILITY OF BUILDINGS TO HANDICAPPED PERSONS: GUIDELINES FOR NORDIC BUILDING REGULATIONS.
Published by the Nordic Committee on Building Regulations. 1974. 30 pages, English and Swedish.

ARCHITECTURAL BARRIERS AND TECHNICAL PLANNING FOR THE HANDICAPPED.
Proceedings of Third Conference of the Federation Internationale Mutiles Invalides du Travail et Invalides Civils (FIMITIC), held 1972 in Oslo. Published by FIMITIC, 1974. Olten, Switzerland.

ARCHITECTURAL PRINCIPLES AND MENTAL RETARDATION.
Published by the International League of Societies for the Mentally Handicapped, Brussels, 1972. Considers roles of architects and planners in field of mental retardation. 36 pages plus bibliography.

DESIGN FOR THE REAL WORLD: HUMAN ECOLOGY AND SOCIAL CHANGE.
By Victor Papanek, with introduction by R. Buckminster Fuller, published by Pantheon Books, New York, 1971. Includes handicapped people among those long neglected by "the industrial design establishment." 309 pages, plus bibliography, illustrated.

INTERNATIONAL REHABILITATION REVIEW: ENVIRONMENT ISSUE.
Published by Rehabilitation International, New York, 1974. Includes article on the environment and handicapped people by Maurice Strong, Director of the United Nations Environment Program, and article on technical aids by Mr. Karl Montan, Director of ICTA.

MODELS OF SERVICE FOR THE MULTI-HANDICAPPED ADULT.
Major papers presented at the International Conference on same, held 1973 in New York by the International Cerebral Palsy Society. Published by United Cerebral Palsy of New York City, Inc., 1974.

PROCEEDINGS
Of the Twelfth World Congress of Rehabilitation International, Sydney, Australia, 1972. Two volumes, 852 pages.

PUBLICATIONS OF REHABILITATION INTERNATIONAL'S CENTER ON TECHNICAL AIDS, HOUSING AND TRANSPORTATION, BROMMA, SWEDEN:

PREPARATION OF A GUIDE FOR DISABLED PERSONS and WELL PLANNED TOWN CENTERS.
Two papers, 1966.

THE PHYSICAL ENVIRONMENT AND THE VISUALLY IMPAIRED:
The Planning and Adaptation of Buildings and other forms of Physical Environment for Visually Impaired People, by Per

NORMS CONCERNING THE ACCESSIBILITY FOR DISABLED PERSONS TO BUILDINGS AND ENVIRONMENTS IN DIFFERENT COUNTRIES.
1974. Includes data on norms in 21 countries, *based on information supplied* by National Secretaries of Rehabilitation International. 15 pages plus chart. (See Annex 1 for chart)

ARCHITECTURAL FACILITIES FOR THE DISABLED.
Cooperative project of ICTA and the Netherlands Society for Rehabilitation, The Hague, 1973. Contains basic data for freedom of movement for physically disabled, *including minimal dimensions*. 32 pages, illustrated. US$2.00.

BELGIUM

ARCHITECTURE ET ACCESSIBILITE.
Published by the Association Nationale pour le Logement des Handicapes, Brussels. Includes drawings and dimensions for wheelchair accessibility in the home and for parking. 14 pages, plus bibliography. French only.

CANADA

THE ELIMINATION OF ARCHITECTURAL BARRIERS TO THE DISABLED: A SELECTED BIBLIOGRAPHY AND REPORT ON LITERATURE IN THE FIELD.
Compiled by Susan Klement, published by the Canadian Rehabilitation Council for the Disabled, Toronto, 1969. Describes *contents of publications dealing with* architectural barriers in, primarily, Canada, Great Britain and the USA. 32 pages plus resource list.

BUILDINGS STANDARDS FOR THE HANDICAPPED 1970: SUPPLEMENT NO. 5 TO THE NATIONAL BUILDING CODE OF CANADA.
Published by the National Research Council of Canada, Ottowa. 24 pages, indexed. C$.25.

HOUSING THE HANDICAPPED.
Published by the Central Mortgage and Housing Corporation of Canada, Ottowa, 1974. Technical data and drawings illustrating minimum criteria for apartment buildings, residential buildings, the dwelling unit and detached houses. 58 pages plus bibliography. English and French.

DENMARK

DENMARK: THE PHYSICALLY HANDICAPPED AND HOUSING.
Published by Comité National Francais pour la Readaptation des Handicapes, Paris, 1970. Photos, technical drawings and text on social, structural and financial aspects of housing for disabled people in Denmark. Unpaged, French.

FINLAND

OHJEITA LIIKUNTAESTEIDEN POISTAMISEKSI
("How to Abolish Ambulatory Bar-

cessibility in public buildings, the home and public transport. 60 pages, illustrated, in Finnish with summary in English.

FRANCE

THE HANDICAPPED AND PUBLIC TRANSPORTATION CONVEYANCES.
Article in December 1974 issue of "Readaptation." (Paris) discusses adaptation of national railways and public conveyances in France and facilities provided to handicapped persons to assist them in travel on mass transportation vehicles. 2 pages, French. English translation available.

LOGEMENT ET HANDICAPES PHYSIQUES: INFORMATIONS, DOCUMENTATION, RECHERCHES,
Les Cahiers de la Vie Quotidienne, published by the Comité National Francais de Liaison pour la Readaptation des Handicapés, Paris, 1973.

NORMES DE CONSTRUCTION: LOGEMENT DES HANDICAPES PHYSIQUES.
Published by Paris Cedex, 1974. Information on new buildings adaptation of existing buildings and norms for accessibility. 24 pages, French. 50FF.

COSTS AND EXTRA COSTS OF ADAPTING HOUSING FOR THE PHYSICALLY DISABLED.
Published by the Comité National Francais de Liaison pour la Réadaptation des Handicapés, Paris, 1973. 6 pages, English and French.

HOUSING OF THE DISABLED.
Paper prepared by the Comité National Francais de Liaison pour la Readaptation des Handicapés on building adaptable dwellings, their planning and cost. Paris, 1974. 3 pages, English and French.

FEDERAL REPUBLIC OF GERMANY

BARRIER-FREE DESIGN IN THE FEDERAL REPUBLIC OF GERMANY.
Report prepared by Ms. J. Etzler of the Stiftung Rehabilitation, Heidelberg, 1975. Discusses status of national legislation and urban activities regarding architectural barriers. 2 pages, plus bibliography, English. (Bibliography includes all major references on this subject in the Federal Republic)

GERMAN DEMOCRATIC REPUBLIC

THE DISABLED PERSON AND HIS SOCIAL ENVIRONMENT.
Paper by Prof. Dr. Karlheinz Renker of the Gesellschaft fur Rehabilitation in der DDR, Halle, 1974. 5 pages, English.

NETHERLANDS

VOORZIENINGEN OPENBARE GEBOUWEN LICHAMELIJK GEHANDICAPTEN.
Published by the Stichting Technische Voorlichting ten Behove van Lichamelijk Gehandicapten, The Hague, 1964. Report of a working group on architecture, in-

HOUSING: INDEPENDENT HOUSING FOR THE HANDICAPPED.

Published by the Netherlands Society for Rehabilitation, The Hague, 1974. General and technical discussion of requirements of adapted housing for handicapped, includes table of requirements according to cost. Booklet accompanies film of same title. 14 pages, illustrated, English.

NETHERLANDS: THE PHYSICALLY HANDICAPPED AND HOUSING.

Published by the Comité National Francais de Liaison pour la Réadaptation des Handicapés, Paris, 1970. Contains photos, technical drawings and text on various housing solutions, examples of already existing developments and recommendations on criteria for public buildings, housing and financial considerations. Unpaged, French.

NEW ZEALAND

CODE OF PRACTICE FOR DESIGN FOR ACCESS BY HANDICAPPED PERSONS

Part 1: Public Buildings and Facilities, published by the New Zealand Standards Association, Wellington, 1974.

SPAIN

MOBILITY OF THE PHYSICALLY DISABLED MOVILIDAD DEL MINUSVALIDO.

Paper by Dr. Gillermo Cabezas Conde, Madrid, 1974. General discussion of status of architectural barrier actions in Spain and recommendations for future action. 22 pages, Spanish, English.

SUPRESION DE BARRERAS ARQUITECTONICAS.

Report by Dr. Gillermo Cabezas Conde, published by the Ministry of Labor of Spain, 1974. General and technical discussion of adaptation of physical environment for the physically disabled, blind and deaf. 23 pages text, 41 pages of graphs and drawings, 20 pages bibliography, Spanish.

SWEDEN

SWEDEN: THE HANDICAPPED AND HOUSING

(Les Handicapes Physiques et le Logement), published by the Comité National Francais de Liaison pour la Réadaptation des Handicapés, Paris, 1970. Contains photos, technical drawings and text on architectural studies in urban planning, housing and legislation in Sweden. Unpaged, French.

ACCESSIBLE HOMES-WORKABLE TOWNS.

Published by National Swedish Building Research, Stockholm, 1972.

HANDIKAPPBYGGNORMER:

Regulations for Access for the Disabled to Buildings, published by the National Swedish Board of Urban Planning, publication no. 24, Stockholm, 1969. General and technical discussion of design and construction of buildings accessible to physically handicapped. 24 pages, illustrated, Swedish with summary in English.

tion, 1971. Technical data and drawings to make buildings and parking areas accessible to disabled people. 22 pages, English, French and German.

CONSIDERATIONS IN CONSTRUCTION FOR THE PHYSICALLY DISABLED.

Published by the Swiss Zentralstelle fur Baurationalisierung, Zurich, 1974. General and technical data on building homes (room by room analysis) and buildings barrier free. 15 pages text, 7 pages of drawings, German, French, Italian.

ARCHITECTURE AND DISABILITY

(Architektur und Invalidität), published by the Schweizerische Arbeitsgemeinschaft zur Eingliederung Behinderter (SAEB), Zurich, 1970. Article by Dr. F. Nuscheler, 8 pages, German.

BAUTECHNISCHE FORDERUNGEN BEHINDERTER MENSCHEN.

Published by the Schweizerische Arbeitsgemeinschaftzur Eingliederung Behinderter (SAEB), Zurich, 1969. General and technical discussion of design of homes and buildings for the disabled. 29 pages, plus bibliography, illustrated, German.

UNITED KINGDOM

DESIGNING FOR THE DISABLED

By Selwyn Goldsmith, published by the Royal Institute of British Architects, London, 1967. Primarily technical data including anthropometrics, building elements and finishes, service installations, general spaces, domestic housing and public buildings, 281 diagrams, 192 pages, plus bibliography, resources, indexed.

PLANNING FOR DISABLED PEOPLE IN THE URBAN ENVIRONMENT.

Published by the Central Council for the Disabled, London, study carried out by Department of Urban Design and Regional Planning, Edinburgh University, 1969. General and technical information, 60 pages plus checklist and bibliography.

A PILOT STUDY OF DISABLED HOUSEWIVES IN THEIR KITCHENS

By P.M. Howie, published by the Disabled Living Foundation, London, 1967. Detailed technical study of requirements of disabled housewives to facilitate work in kitchen and adjacent work centers. 102 pages, illustrated, plus bibliography.

INTERIM REPORT OF THE WORKING PARTY ON HOUSING FOR DISABLED PEOPLE.

Published by the Central Council for the Disabled, London, 1975. Evaluation of status of legislative and other national efforts to meet the special housing needs of disabled people in Great Britain. 60 pages plus recommendations.

EQUIPMENT FOR THE DISABLED: AN INDEX OF EQUIPMENT, AIDS AND IDEAS FOR THE DISABLED.

Published by National Fund for Research into Crippling Diseases, London, 1967, revised 1974. Series of booklets on various aspects of assistance to disabled people, includes housing.

and types of buildings covered by Code (individual dwellings excluded) and recommendations on design. 18 pages text, 10 pages diagrams.

UNITED STATES

AMERICAN NATIONAL STANDARD: SPECIFICATIONS FOR MAKING BUILDINGS AND FACILITIES ACCESSIBLE TO, AND USABLE BY THE PHYSICALLY HANDICAPPED.

Published by the American National Standards Institute, Inc., 1961. Includes definition of disabilities and considers site development, buildings, (exteriors and interiors), technical presentation. 11 pages.

FIRST REPORT TO THE CONGRESS OF THE UNITED STATES OF THE ARCHITECTURAL AND TRANSPORTATION BARRIERS COMPLIANCE BOARD.

Published by the Board, Washington, D.C., 1974. Reports current activities and future plans regarding attitudinal barriers, transportation policy, outdoor spaces and housing alternatives. 168 pages.

MAKING FACILITIES ACCESSIBLE TO THE PHYSICALLY HANDICAPPED: PERFORMANCE CRITERIA.

Published by the State University of New York, 1967. Design criteria for making university buildings accessible to physically handicapped. 40 pages, illustrated.

"PEOPLE ARE ASKING ABOUT . . .".

Published jointly by the President's Committee on Employment of the Handicapped and the National Easter Seal Society for Crippled Children and Adults, Inc., Chicago, 1974. Pamphlet explains origin, purposes and criteria for use of the International Symbol of Access. 12 pages, illustrated.

AIRLINE TRANSPORTATION FOR THE HANDICAPPED AND DISABLED,

By Stanley G. Hogsett, published by the National Easter Seal Society for Crippled Children and Adults, Inc., Chicago, 1971. Considers Terminal Facilities and Aircraft Design, Domestic Regulations and Guidelines, Medical Criteria for Air Travel and Services offered to Disabled Passengers by Individual Airlines. 45 pages, includes various charts.

A SURVEY OF STATE LAWS TO REMOVE BARRIERS.

Published by the President's Committee on Employment of the Handicapped, Washington, 1973. Cites legislation, whether pertains to public buildings or private, the responsibility for enforcement and whether there are sanctions for noncompliance. Unpaged, table format.

ARCHITECTURAL BARRIERS KIT.

Published by the National Easter Seal Society for Crippled Children and Adults, Inc., Chicago, 1974. This kit contains a set of materials on how to organize a community architectural barriers task force, how to conduct a survey of architectural barrier and how to publish a guide to accessible facilities in the community. Also contains bibliography, price varies with quantity ordered.

f Access



A *resolution on policy concerning the Symbol of Access was adopted as follows by the Assembly of Rehabilitation International at its meeting September 19-21, 1974 in Offir, Portugal:*

Having in 1969 approved and adopted the concept and the design of the International Symbol of Access as recommended by the International Committee on Technical Aids, Housing and Transportation (ICTA):

Having made the Symbol freely available to all mankind so that its use might contribute to the protection of the rights of all disabled persons and specifically to an improvement in the availability to disabled persons of the resources and facilities of communities in which they live;

Noting with satisfaction that the Symbol has been widely accepted for the purposes intended by the Assembly, that it has been officially adopted by many public and private authorities and that its use is increasingly evident throughout the world;

Believing that the proper use of the Symbol has not only assisted millions of disabled persons in locating, identifying and being able to use accessible facilities, but also has created a more general awareness of the problems of accessibility faced by disabled persons and thus helped to stimulate action to eliminate environmental barriers;

Concerned, however, that the use of the Symbol for more general purposes or in forms other than that approved by the Assembly distorts the intent of the Assembly and reduces the value of the Symbol as an easily and internationally recognizable identification of facilities accessible to disabled persons:

Proclaims the following policies to govern the use of the International Symbol of Access:

1 The Symbol shall always be used in the design and proportions approved by the Assembly. (See above.) The colors used shall always be in sharp contrast and, unless there are compelling reasons to use other colors, the Symbol and its background shall be reproduced either in black or white or dark blue and white.

2 No change in or addition to the design shall be permitted.

3 With the exception stated in Para.4 below, the Symbol shall never be used for any purpose other than to identify mark or show the way to facilities that are accessible to persons whose mobility is restricted by disability. The standards of accessibility to be applied should be established by the responsible authorities in each country and it is recommended that they be guided by the recommendations of the United Nations Expert Meeting on Barrier-Free Design, which was held in 1974. The report and recommendations of the meeting are being published and made available by Rehabilitation International.

4 It is recognized that the popularization and universal recognition of the Symbol will be assisted by its reproduction in published material and other media relevant to services for the disabled so long as it is always clearly and conspicuously identified as "The International Symbol of Access." Such use is authorized.

5 Affiliated National Organizations of Rehabilitation International or other agencies so authorized in writing by Rehabilitation International may obtain national legal protection of the Symbol and control of its use in accordance with the policies stated in this resolution.

Appeals to all concerned to seek the widest possible use of the symbol in the manner specified in this resolution, and to avoid

Requests the Member Organizations of Rehabilitation International and all cooperating bodies to make the contents of this

Organization of the Meeting

The Expert Group elected a Chairman, Vice-Chairman and Rapporteur for its discussions. The meeting was officially opened by the representative of the Secretary General of the United Nations who welcomed the participants, noting that this was a historic occasion since it was the first time that this particular problem was to be discussed at the United Nations. In bringing together the experts, the primary objective was to consider the possibility as well as the means of eliminating those barriers which prevent disabled persons from participating fully in all aspects of life in the community. He urged the meeting to keep in mind the cultural and economic differences which exist in different countries and hoped that the proposed solutions would have far-reaching results for the betterment of handicapped people of all countries.

He noted that large numbers of disabled, chronically ill and elderly persons were affected daily by barriers which impeded their access to public buildings, schools, places of employment, as well as mobility in their own homes. Elimination of such barriers is essential to the social integration of handicapped people, as well as to their economic independence.

In convening the Expert Group Meeting on Barrier-Free Design, invitations were extended to persons who had demonstrated their expertise in a number of areas related to the task assigned -medical aspects, architectural design, legislative, administrative, social action and others.

The participants included (a) experts appointed by the United Nations in consultation with the International Labor Organization (ILO), the United Nations, Educational, Cultural and Scientific Organization (UNESCO), the World Health Organization (WHO) and the Council of World Organizations Interested in the Handicapped (CWOIH), (b) experts whose services had been offered by interested governments or national organizations and accepted by the United Nations and (c) representatives of the United Nations Secretariat, Pan American Health Organization, Reha-



Chronically Sick and Disabled Persons Act 1970

CHAPTER 44

ARRANGEMENT OF SECTIONS

Welfare and housing

Section

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29. Short title, extent and commencement.

ELIZABETH II



1970 CHAPTER 44

An Act to make further provision with respect to the welfare of chronically sick and disabled persons; and for connected purposes. [29th May 1970]

BE IT ENACTED by the Queen's most Excellent Majesty, by and with the advice and consent of the Lords Spiritual and Temporal, and Commons, in this present Parliament assembled, and by the authority of the same, as follows:—

Welfare and housing

Information as to need for and existence of welfare services. 1948 c. 29.

1.—(1) It shall be the duty of every local authority having functions under section 29 of the National Assistance Act 1948 to inform themselves of the number of persons to whom that section applies within their area and of the need for the making by the authority of arrangements under that section for such persons.

(2) Every such local authority—

(*a*) shall cause to be published from time to time at such times and in such manner as they consider appropriate general information as to the services provided under arrangements made by the authority under the said section 29 which are for the time being available in their area; and

(*b*) shall ensure that any such person as aforesaid who uses any of those services is informed of any other of those services which in the opinion of the authority is relevant to his needs.

(3) This section shall come into operation on such date as the Secretary of State may by order made by statutory instrument appoint.

ovision welfare rvices. 48 c. 29.

2.—(1) Where a local authority having functions under section 29 of the National Assistance Act 1948 are satisfied in the case of any person to whom that section applies who is ordinarily resident in their area that it is necessary in order to meet the needs of that person for that authority to make arrangements for all or any of the following matters, namely—

(*a*) the provision of practical assistance for that person in his home;

(*b*) the provision for that person of, or assistance to that person in obtaining, wireless, television, library or similar recreational facilities;

(*c*) the provision for that person of lectures, games, outings or other recreational facilities outside his home or assistance to that person in taking advantage of educational facilities available to him;

(*d*) the provision for that person of facilities for, or assistance in, travelling to and from his home for the purpose of participating in any services provided under arrangements made by the authority under the said section 29 or, with the approval of the authority, in any services provided otherwise than as aforesaid which are similar to services which could be provided under such arrangements;

(*e*) the provision of assistance for that person in arranging for the carrying out of any works of adaptation in his home or the provision of any additional facilities designed to secure his greater safety, comfort or convenience;

(*f*) facilitating the taking of holidays by that person, whether at holiday homes or otherwise and whether provided under arrangements made by the authority or otherwise;

(*g*) the provision of meals for that person whether in his home or elsewhere;

(*h*) the provision for that person of, or assistance to that person in obtaining, a telephone and any special equipment necessary to enable him to use a telephone,

then, notwithstanding anything in any scheme made by the authority under the said section 29, but subject to the provisions of section 35(2) of that Act (which requires local authorities to exercise their functions under Part III of that Act under the general guidance of the Secretary of State and in accordance with the provisions of any regulations made for the purpose), it shall be the duty of that authority to make those arrangements in exercise of their functions under the said section 29.

(2) Without prejudice to the said section 35(2), subsection (3)

a local authority under that section to be carried into effect in accordance with a scheme made thereunder) shall not apply—

(*a*) to any arrangements made in pursuance of subsection (1) of this section; or

(*b*) in the case of a local authority who have made such a scheme, to any arrangements made by virtue of subsection (1) of the said section 29 in addition to those required or authorised by the scheme which are so made with the approval of the Secretary of State.

Duties of housing authorities. 1957 c. 56.

3.—(1) Every local authority for the purposes of Part V of the Housing Act 1957 in discharging their duty under section 91 of that Act to consider housing conditions in their district and the needs of the district with respect to the provision of further housing accommodation shall have regard to the special needs of chronically sick or disabled persons; and any proposals prepared and submitted to the Minister by the authority under that section for the provision of new houses shall distinguish any houses which the authority propose to provide which make special provision for the needs of such persons.

(2) In the application of this section to Scotland for the words "Part V of the Housing Act 1957", "91" and "Minister" there shall be substituted respectively the words "Part VII of the Housing (Scotland) Act 1966", "137" and "Secretary of State". 1966 c. 49.

Premises open to public

Access to, and facilities at, premises open to the public.

4.—(1) Any person undertaking the provision of any building or premises to which the public are to be admitted, whether on payment or otherwise, shall, in the means of access both to and within the building or premises, and in the parking facilities and sanitary conveniences to be available (if any), make provision, in so far as it is in the circumstances both practicable and reasonable, for the needs of members of the public visiting the building or premises who are disabled.

(2) This section shall not apply to any building or premises intended for purposes mentioned in subsection (2) of section 8 of this Act.

Provision of public sanitary conveniences.

5.—(1) Where any local authority undertake the provision of a public sanitary convenience, it shall be the duty of the authority, in doing so, to make provision, in so far as it is in the circumstances both practicable and reasonable, for the needs of disabled persons.

(2) Any local authority which in any public sanitary convenience provided by them make or have made provision for the needs of disabled persons shall take such steps as may be reasonable, by sign-posts or similar notices, to indicate the whereabouts of the convenience.

(3) In this section "local authority" means a local authority within the meaning of the Local Government Act 1933 or the Local Government (Scotland) Act 1947 and any joint board or joint committee of which all the constituent authorities are local authorities within the meaning of either of those Acts.

1933 c. 51.
1947 c. 43.

Provision of sanitary conveniences at certain premises open to the public.

6.—(1) Any person upon whom a notice is served with respect to any premises under section 89 of the Public Health Act 1936 (which empowers local authorities by notice to make requirements as to the provision and maintenance of sanitary conveniences for the use of persons frequenting certain premises used for the accommodation, refreshment or entertainment of members of the public) shall in complying with that notice make provision, in so far as it is in the circumstances both practicable and reasonable, for the needs of persons frequenting those premises who are disabled.

1936 c. 49.

(2) The owner of a building, who has been ordered under section 11(4) of the Building (Scotland) Act 1959 to make the building conform to a provision of building standards regulations made under section 3 of that Act requiring the provision of suitable and sufficient sanitary conveniences therein, shall in complying with that order make provision, in so far as it is in the circumstances both practicable and reasonable, for the needs of persons frequenting that building who are disabled.

1959 c. 24.

Signs at buildings complying with ss. 4–6.

7. -(1) Where any provision required by or under section 4, 5 or 6 of this Act is made at a building in compliance with that section, a notice or sign indicating that provision is made for the disabled shall be displayed outside the building or so as to be visible from outside it.

(2) This section applies to a sanitary convenience provided elsewhere than in a building, and not itself being a building, as it applies to a building.

University and school buildings

Access to, and facilities at, university and school buildings.

8. - (1) Any person undertaking the provision of a building intended for purposes mentioned in subsection (2) below shall, in the means of access both to and within the building, and in the parking facilities and sanitary conveniences to be available (if any), make provision, in so far as it is in the circumstances both practicable and reasonable, for the needs of persons using the building who are disabled.

(2) The purposes referred to in subsection (1) above are the purposes of any of the following:—

(*a*) universities, university colleges and colleges, schools and halls of universities;

(b) schools within the meaning of the Education Act 1944, teacher training colleges maintained by local education authorities in England or Wales and other institutions providing further education pursuant to a scheme under section 42 of that Act; 1944 c. 31.

(c) educational establishments within the meaning of the Education (Scotland) Act 1962. 1962 c. 37.

Advisory committees, etc.

Central advisory committee on war pensions. 1921 c. 49.

9.—(1) The Secretary of State shall ensure that the central advisory committee constituted under section 3 of the War Pensions Act 1921 includes the chairmen of not less than twelve of the committees established by schemes under section 1 of that Act and includes at least one war disabled pensioner, and shall cause that central advisory committee to be convened at least once in every year.

(2) This section extends to Northern Ireland.

Housing Advisory Committees. 1957 c. 56. 1966 c. 49.

10. In the appointment of persons to be members of the Central Housing Advisory Committee set up under section 143 of the Housing Act 1957 or of the Scottish Housing Advisory Committee set up under section 167 of the Housing (Scotland) Act 1966, regard shall be had to the desirability of that Committee's including one or more persons with knowledge of the problems involved in housing the chronically sick and disabled and to the person or persons with that knowledge being or including a chronically sick or disabled person or persons.

National Insurance Advisory Committee.

11. The National Insurance Advisory Committee shall include at least one person with experience of work among and of the needs of the chronically sick and disabled and in selecting any such person regard shall be had to the desirability of having a chronically sick or disabled person.

Industrial Injuries Advisory Council.

12. The Industrial Injuries Advisory Council shall include at least one person with experience of work among and of the needs of the chronically sick and disabled and in selecting any such person regard shall be had to the desirability of having a chronically sick or disabled person.

Youth employment service.

13.—(1) Without prejudice to any other arrangements that may be made by the Secretary of State, the Central Youth Employment Executive shall include at least one person with special responsibility for the employment of young disabled persons.

(2) In the appointment of persons to be members of any of the bodies constituted in pursuance of section 8(1) of the Employment and Training Act 1948 (that is to say, the National Youth 1948 c. 46.

Employment Council and the Advisory Committees on Youth Employment for Scotland and Wales respectively) regard shall be had to the desirability of the body in question including one or more persons with experience of work among, and the special needs of, young disabled persons and to the person or persons with that experience being or including a disabled person or persons.

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14.—(1) In the appointment of persons to be members of any of the following advisory committees or councils, that is to say, the Transport Users' Consultative Committees, the Gas Consultative Councils, the Electricity Consultative Councils, the Post Office Users' Councils and the Domestic Coal Consumers' Council, regard shall be had to the desirability of the committee or council in question including one or more persons with experience of work among, and the special needs of, disabled persons and to the person or persons with that experience being or including a disabled person or persons.

(2) In this section the reference to the Post Office Users' Councils is a reference to the Councils established under section 14 of the Post Office Act 1969, and in relation to those Councils this section shall extend to Northern Ireland.

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15. Where a local authority within the meaning of the Local Government Act 1933 or the Local Government (Scotland) Act 1947 appoint a committee of the authority under any enactment, and the members of the committee include or may include persons who are not members of the authority, then in considering the appointment to the committee of such persons regard shall be had, if the committee is concerned with matters in which the chronically sick or disabled have special needs, to the desirability of appointing to the committee persons with experience of work among and of the needs of the chronically sick and disabled, and to the person or persons with that experience being or including a chronically sick or disabled person or persons.

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16. The duties of the national advisory council established under section 17(1)(*a*) of the Disabled Persons (Employment) Act 1944 shall include in particular the duty of giving to the Secretary of State such advice as appears to the council to be necessary

Separation of younger from older patients. 1946 c. 81. 1947 c. 27.

17.—(1) Every Board constituted under section 11 of the National Health Service Act 1946 (that is to say, every Regional Hospital Board and every Board of Governors of a teaching hospital) and every Regional Hospital Board constituted under section 11 of the National Health Service (Scotland) Act 1947 shall use their best endeavours to secure that, so far as practicable, in any hospital for which they are responsible a person who is suffering from a condition of chronic illness or disability and who—

(*a*) is in the hospital for the purpose of long-term care for that condition; or

(*b*) normally resides elsewhere but is being cared for in the hospital because—

(i) that condition is such as to preclude him from residing elsewhere without the assistance of some other person; and

(ii) such assistance is for the time being not available,

is not cared for in the hospital as an in-patient in any part of the hospital which is normally used wholly or mainly for the care of elderly persons, unless he is himself an elderly person.

(2) Each such Board as aforesaid shall provide the Secretary of State in such form and at such times as he may direct with such information as he may from time to time require as to any persons to whom subsection (1) of this section applied who, not being elderly persons, have been cared for in any hospital for which that Board are responsible in such a part of the hospital as is mentioned in that subsection; and the Secretary of State shall in each year lay before each House of Parliament such statement in such form as he considers appropriate of the information obtained by him under this subsection.

(3) In this section "elderly person" means a person who is aged sixty-five or more or is suffering from the effects of premature ageing.

Information as to accommodation of younger with older persons under Part III of National Assistance Act 1948. 1948 c. 29.

18.—(1) The Secretary of State shall take steps to obtain from local authorities having functions under Part III of the National Assistance Act 1948 information as to the number of persons under the age of 65 appearing to the local authority in question to be persons to whom section 29 of that Act applies for whom residential accommodation is from time to time provided under section 21(1)(*a*) or 26(1)(*a*) of that Act at any premises in a part of those premises in which such accommodation is so provided for persons over that age.

1968 c. 49. 1960 c. 61.

(2) The Secretary of State shall take steps to obtain from local authorities having functions under the Social Work (Scotland) Act 1968 information as to the number of persons under the age of 65 who suffer from illness or mental disorder within the meaning of section 6 of the Mental Health (Scotland) Act 1960 or are substantially handicapped by any deformity or disability and for whom residential accommodation is from time to time provided under section 59 of the said Act of 1968 at any premises in a part of those premises in which such accommodation is so provided for persons over that age.

(3) Every local authority referred to in this section shall provide the Secretary of State in such form and at such times as he may direct with such information as he may from time to time require for the purpose of this section; and the Secretary of State shall in each year lay before each House of Parliament such statement in such form as he considers appropriate of the information obtained by him under this section.

Provision of information relating to chiropody services. 1968 c. 46. 1947 c. 27.

19. Every local health authority empowered to provide chiropody services under section 12 of the Health Services and Public Health Act 1968, or under section 27 of the National Health Service (Scotland) Act 1947, shall provide the Secretary of State in such form and at such times as he may direct with information as to the extent to which those services are available and used for the benefit of disabled persons under the age of sixty-five.

Miscellaneous provisions

Use of invalid carriages on highways.

20. (1) In the case of a vehicle which is an invalid carriage complying with the prescribed requirements and which is being used in accordance with the prescribed conditions—

(*a*) no statutory provision prohibiting or restricting the use of footways shall prohibit or restrict the use of that vehicle on a footway;

(*b*) if the vehicle is mechanically propelled, it shall be treated for the purposes of the Road Traffic Act 1960, the Road Traffic Act 1962, the Road Traffic Regulation Act 1967 and Part I of the Road Safety Act 1967 as not being a motor vehicle; and

1960 c. 16. 1962 c. 59. 1967 c. 76. 1967 c. 30.

(*c*) whether or not the vehicle is mechanically propelled, it shall be exempted from the requirements of the Road Transport Lighting Act 1957.

1957 c. 51.

(2) In this section—

"footway" means a way which is a footway, footpath or bridleway within the meaning of the Highways Act 1959;

1959 c. 25.

and in its application to Scotland means a way over which the public has a right of passage on foot only or a bridleway within the meaning of section 47 of the Countryside (Scotland) Act 1967; 1967 c. 86.

"invalid carriage" means a vehicle, whether mechanically propelled or not, constructed or adapted for use for the carriage of one person, being a person suffering from some physical defect or disability;

"prescribed" means prescribed by regulations made by the Minister of Transport;

"statutory provision" means a provision contained in, or having effect under, any enactment.

(3) Any regulations made under this section shall be made by statutory instrument, may make different provision for different circumstances and shall be subject to annulment in pursuance of a resolution of either House of Parliament.

Badges for display on motor vehicles used by disabled persons.

21.—(1) There shall be a badge of a prescribed form to be issued by local authorities for motor vehicles driven by, or used for the carriage of, disabled persons; and—

(*a*) subject to the provisions of this section, the badge so issued for any vehicle or vehicles may be displayed on it or on any of them either inside or outside the area of the issuing authority; and

(*b*) any power under section 84C of the Road Traffic Regulation Act 1967 (which was inserted by the Transport Act 1968) to make regulations requiring that orders under the Act shall include exemptions shall be taken to extend to requiring that an exemption given with reference to badges issued by one authority shall be given also with reference to badges issued by other authorities. 1967 c. 76. 1968 c. 73.

(2) A badge may be issued to a disabled person of any prescribed description resident in the area of the issuing authority for one or more vehicles which he drives and, if so issued, may be displayed on it or any of them at times when he is the driver.

(3) In such cases as may be prescribed, a badge may be issued to a disabled person of any prescribed description so resident for one or more vehicles used by him as a passenger and, if so issued, may be displayed on it or any of them at times when the vehicle is being used to carry him.

A badge may be issued to the same person both under this subsection and under subsection (2) above.

(4) A badge may be issued to an institution concerned with the care of the disabled for any motor vehicle or, as the case

may be, for each motor vehicle kept in the area of the issuing authority and used by or on behalf of the institution to carry disabled persons of any prescribed description; and any badge so issued may be displayed on the vehicle for which it is issued at times when the vehicle is being so used.

(5) A local authority shall maintain a register showing the holders of badges issued by the authority under this section, and the vehicle or vehicles for which each of the badges is held; and in the case of badges issued to disabled persons the register shall show whether they were, for any motor vehicle, issued under subsection (2) or under subsection (3) or both.

(6) A badge issued under this section shall remain the property of the issuing authority, shall be issued for such period as may be prescribed, and shall be returned to the issuing authority in such circumstances as may be prescribed.

(7) Anything which is under this section to be prescribed shall be prescribed by regulations made by the Minister of Transport and Secretary of State by statutory instrument, which shall be subject to annulment in pursuance of a resolution of either House of Parliament; and regulations so made may make provision—

(*a*) as to the cases in which authorities may refuse to issue badges, and as to the fee (if any) which an authority may charge for the issue or re-issue of a badge; and

(*b*) as to the continuing validity or effect of badges issued before the coming into force of this section in pursuance of any scheme having effect under section 29 of the National Assistance Act 1948 or any similar scheme having effect in Scotland; and

1948 c. 29.

(*c*) as to any transitional matters, and in particular the application to badges issued under this section of orders made before it comes into force and operating with reference to any such badges as are referred to in paragraph (*b*) above (being orders made, or having effect as if made, under the Road Traffic Regulation Act 1967).

1967 c. 76.

(8) The local authorities for purposes of this section shall be the common council of the City of London, the council of a county or county borough in England or Wales or of a London borough and the council of a county or large burgh in Scotland; and in this section "motor vehicle" has the same meaning as in the Road Traffic Regulation Act 1967.

(9) This section shall come into operation on such date as the Minister of Transport and Secretary of State may by order made by statutory instrument appoint.

Annual report on research a developm work.

22. The Secretary of State shall as respects each year lay before Parliament a repo" on the progress made during that year in research and development work carried out by or on behalf of any Minister of the Crown in relation to equipment that might increase the range of activities and independence or well-being of disabled persons, and in particular such equipment that might improve the indoor and outdoor mobility of such persons.

War pensi appeals. 1943 c. 39

23.—(1) The Pensions Appeal Tribunals Act 1943 shall have effect with the amendments specified in the subsequent provisions of this section.

(2) In section 5—

(*a*) so much of subsection (1) as prevents the making of an appeal from an interim assessment of the degree of a disablement before the expiration of two years from the first notification of the making of an interim assessment (that is to say, the words from "if" to "subsection" where first occurring, and the words "in force at the expiration of the said period of two years") is hereby repealed except in relation to a claim in the case of which the said first notification was given before the commencement of this Act;

(*b*) in the second paragraph of subsection (1) (which defines "interim assessment" for the purposes of that subsection), for the words "this subsection" there shall be substituted the words "this section";

(*c*) in subsection (2) (which provides for an appeal to a tribunal from a Ministerial decision or assessment purporting to be a final settlement of a claim) at the end there shall be added the words "and if the Tribunal so set aside the Minister's decision or assessment they may, if they think fit, make such interim assessment of the degree or nature of the disablement, to be in force until such date not later than two years after the making of the Tribunal's assessment, as they think proper";

(*d*) subsection (3) (which makes provision as to the coming into operation of section 5) is hereby repealed.

(3) In section 6, after subsection (2) there shall be inserted the following subsection—

"(2A) Where, in the case of such a claim as is referred to in section 1, 2, 3 or 4 of this Act—

(*a*) an appeal has been made under that section to the Tribunal and that appeal has been decided (whether with or without an appeal under subsection (2) of this section from the Tribunal's decision); but

(*b*) subsequently, on an application for the purpose made (in like manner as an application for leave to appeal under the said subsection (2)) jointly by the appellant and the Minister, it appears to the appropriate authority (that is to say, the person to whom under rules made under the Schedule to this Act any application for directions on any matter arising in connection with the appeal to the Tribunal fell to be made) to be proper so to do

(i) by reason of the availability of additional evidence; or

(ii) (except where an appeal from the Tribunal's decision has been made under the said subsection (2)), on the ground of the Tribunal's decision being erroneous in point of law,

the appropriate authority may, if he thinks fit, direct that the decision on the appeal to the Tribunal be treated as set aside and the appeal from the Minister's decision be heard again by the Tribunal ".

(4) In subsection (3) of section 6 (under which, subject to subsection (2) of that section, a tribunal's decision is final and conclusive) for the words " subject to the last foregoing subsection " there shall be substituted the words " subject to subsections (2) and (2A) of this section ".

S.I. 1968/1699.

(5) In consequence of the Secretary of State for Social Services Order 1968, in section 12(1), for the definition of " the Minister " there shall be substituted the following:—

" ' the Minister ' means the Secretary of State for Social Services ".

(6) This section extends to Northern Ireland.

Institute of hearing research.

24. The Secretary of State shall collate and present evidence to the Medical Research Council on the need for an institute for hearing research, such institute to have the general function of co-ordinating and promoting research on hearing and assistance to the deaf and hard of hearing.

Special educational

25. (1) It shall be the duty of every local education authority

(3) In the application of this section to Scotland for any reference to a local education authority there shall be substituted a reference to an education authority within the meaning of section 145 of the Education (Scotland) Act 1962. 1962 c. 47.

Special educational treatment for children suffering from autism, &c.

26.—(1) It shall be the duty of every local education authority to provide the Secretary of State at such times as he may direct with information on the provision made by that local education authority of special educational facilities for children who suffer from autism or other forms of early childhood psychosis.

(2) The arrangements made by a local education authority for the special educational treatment of children suffering from autism and other forms of early childhood psychosis shall, so far as is practicable, provide for the giving of such education in any school maintained or assisted by the local education authority.

(3) In the application of this section to Scotland for any reference to a local education authority there shall be substituted a reference to an education authority within the meaning of section 145 of the Education (Scotland) Act 1962.

Special educational treatment for children suffering from acute dyslexia.

27.—(1) It shall be the duty of every local education authority to provide the Secretary of State at such times as he may direct with information on the provision made by that local education authority of special educational facilities for children who suffer from acute dyslexia.

(2) The arrangements made by a local education authority for the special educational treatment of children suffering from acute dyslexia shall, so far as is practicable, provide for the giving of such education in any school maintained or assisted by the local education authority.

(3) In the application of this section to Scotland for any reference to a local education authority there shall be substituted a reference to an education authority within the meaning of section 145 of the Education (Scotland) Act 1962.

Power to define certain expressions.

28. Where it appears to the Secretary of State to be necessary or expedient to do so for the proper operation of any provision of this Act, he may by regulations made by statutory instrument, which shall be subject to annulment in pursuance of a resolution of either House of Parliament, make provision as to the interpretation for the purposes of that provision of any of the following expressions appearing therein, that is to say, " chronically sick ", " chronic illness ", " disabled " and " disability ".

Short title, extent and commencement.

29.—(1) This Act may be cited as the Chronically Sick and Disabled Persons Act 1970.

(2) Sections 1 and 2 of this Act do not extend to Scotland.

(3) Save as otherwise expressly provided by sections 9, 14 and 23, this Act does not extend to Northern Ireland.

(4) This Act shall come into force as follows:—

(*a*) sections 1 and 21 shall come into force on the day appointed thereunder;

(*b*) sections 4, 5, 6, 7 and 8 shall come into force at the expiration of six months beginning with the date this Act is passed;

(*c*) the remainder shall come into force at the expiration of three months beginning with that date.

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Ministry of Transport
St Christopher House
Southwark Street
London SE1

To:

County Councils
County Borough Councils
Borough and District Councils
London Borough Councils
Greater London Council
} **England**

17 August 1970

Dear Sir

THE CHRONICALLY SICK AND DISABLED PERSONS ACT 1970

1. I am writing with the agreement of the four Departments principally concerned with the operation of the Act to draw attention to and comment on it in general terms by reference to the subject matter dealt with rather than numerical order of Sections. Other occasions will be taken to pursue certain aspects in greater depth, notably when the report is published early in 1971 of the study by the Office of Population Censuses and Surveys of the number, dependency, financial and housing circumstances and involvement in the health and welfare services of adult chronically sick and handicapped people living at home. Authorities are invited to write to the appropriate Departments on matters within their respective responsibilities.

2. DATES OF OPERATION OF THE ACT. Sections 2-3, 9-20 and 22-28 come into force on 29 August 1970. Sections 4-8 come into force on 29 November 1970 and Sections 1 and 21 are subject to decisions as to an Appointed Day.

GENERAL

3. PURPOSE OF THE ACT. As your Council will know, the Act was introduced as a Private Member's Bill and had a wide measure of approval in both Houses of Parliament. Its underlying

confident that local authorities will have these purposes in mind in the administration of Sections with which they are concerned.

4. SCOPE OF THE ACT. Sections 1, 2 and 18 relate to persons who are substantially and permanently handicapped for the purposes of Section 29 of the National Assistance Act 1948 and also the mentally handicapped. In other Sections, the intention as to scope appears evident without further description, but the appropriate Secretary of State is empowered by Section 28 to define terms used in the Act, if the need should arise, by regulations; and definitions of the same terms may vary from Section to Section as the case requires. Any regulations would specifically refer to mental disorder where the context required it; and it is expected that a similar approach will be adopted by those concerned with operation of the Act. Departments will be willing to give informal advice as required.

SECTIONS OF SPECIAL INTEREST TO HEALTH AND WELFARE AUTHORITIES

5. SECTION 1 has two objects. *First*, it requires the authorities concerned to secure that they are adequately informed of the numbers and needs of substantially and permanently handicapped persons in order that they can formulate satisfactory plans for developing their services. The DHSS are considering what guidance can be given to authorities as to economical means of using social survey techniques for these purposes (and others). They will be guided in part by the report of the survey referred to above, which will itself enable authorities to make a preliminary assessment. It is *not* a requirement of the Section that authorities should attempt 100% identification and registration of the handicapped. This would be a difficult, expensive and time consuming exercise, diverting excessive resources from effective work with those who are already known, involving a restrictive and artificial definition and likely to be counter-productive. *Secondly*, it is intended that those who might benefit by help, and their families, should know what help is available to them and this is to be secured both by general publicity and by personal explanations. The relevant information includes, of course, matters referred to in SECTION 2 and perhaps particularly practical forms of help in the home and personal aids. Authorities are not precluded in any way from assisting by agreement in publicising by these means any other service or facility available from a non-social service source in their area which may be of advantage to handicapped people.

6. The Secretary of State does not intend to make an order bringing the Section into force until the Local Authority Social Services Act is in force and the administration of these powers can be entrusted to the new social services departments. Welfare authorities will realise however that the generality of their powers already enables them to make progress in building up their knowledge and disseminating information as and when opportunity offers; among important sources of information are other local authority departments who may know of people not known to the welfare services.

7. SECTION 2. The effect of sub-section 2(1) (read with sub-section 2(2) (a)) is to remove from approved schemes under Section 29 of the National Assistance Act 1948 any reference to any of the matters set out in sub-sections 2(1) (a) to (h) (or any like reference) and to create statutory duties in these matters together with certain additions. The duty requires the authority to assess the requirements of individuals determined by them to be substantially and permanently handicapped as to their needs in these matters. If they are satisfied that an individual is in need in any (or all) of these matters, they are to make arrangements that are appropriate to his or her case. The task of assessment should be undertaken as a normal part of the authority's social work service, ie, it should be an occasion for considering all relevant needs and not merely those to which the Section refers; and a judgment whether these needs or others are of prior importance should be drawn from a complete and not a partial picture of the situation. Criteria of need are matters for the authorities to determine in the light of resources.

Most of the matters with which the sub-section deals will already be familiar to welfare authorities and do not call for comment. The Section should not, however, be interpreted to empower the welfare department to undertake part of a service (eg education or library facilities) for which there are responsibilities under other legislation. Authorities will no doubt wish to discuss with voluntary bodies active in their area how far they can contribute help in providing services.

8. SUB-SECTION (2) additionally enables authorities to dispense with the formalities of Section

and plans for the establishment of these will no doubt take into account the requirements of the Section.

10. SECTION 18 has the object of securing that Parliament is annually informed of situations in which welfare authorities (and successor social service departments) provide, directly or indirectly, residential accommodation for elderly and younger people together, the age point 65 being taken as a convenient division for these purposes; and authorities will be informed later this year of the information needed. Authorities are, of course, under a duty (under Section 21(2) of the 1948 Act) to have regard to the welfare of all residents and to provide different accommodation for different descriptions of residents.

11. SECTION 17 makes provision for the separation of certain younger patients from the older patients in hospital and also for information to be laid before Parliament each year about patients who are not placed in accordance with the provisions of this Section.

12. SECTION 19 relates to statistics of chiropody services, about which a further letter will be sent to health authorities in the near future.

13. SECTIONS 22 and 24 relate to reports which the Secretary of State for Social Services is to prepare, annually, as to the state of research and development under Government auspices into equipment for the disabled and, specially, as to the need for an Institute of Hearing.

14. SECTION 23 is likely to be of interest to professional workers who are in a position to advise war pensioners. The Section extends and simplifies certain war pensions appeal rights and procedures. It provides a right of appeal against the decision of the DHSS on the assessment of disablement during the first two years of a pension award (there is already a right of appeal for subsequent periods); it enables a Pensions Appeals Tribunal to determine an interim assessment of disablement at the same hearing as the Tribunal sets aside a final award; and it extends slightly the powers of the President of the Pensions Appeals Tribunal in cases where cogent new evidence comes to light after a Tribunal's decision.

SECTIONS OF SPECIAL INTEREST TO EDUCATION AUTHORITIES

15. SECTIONS 25, 26 and 27 of the Act cover the educational needs of children who suffer from deaf-blindness, autism or other forms of early childhood psychosis, and acute dyslexia respectively. In each Section the first sub-section empowers the Secretary of State to require local education authorities to provide information about the provision which they make for children with these handicaps; the second sub-section lays upon authorities the duty of providing for the education of these children in schools maintained or assisted by them so far as that is practicable; the third sub-section applies to Scotland only. In connection with the second sub-section, the attention of authorities is drawn to the definition of the term "assisted school" in Section 114(2) of the Education Act 1944. The effect of this definition is that any school at which a local education authority pays the fees of a pupil is deemed to be assisted by that authority.

16. The attention of local education authorities is also drawn to paragraphs 31-33 of this circular which refer to the requirements of Section 8 of the Act, covering the provision of access and facilities for the disabled in educational buildings.

SECTIONS OF SPECIAL INTEREST TO TRAFFIC AUTHORITIES

17. SECTION 20 is intended to benefit disabled people who can get about only in powered or power-assisted invalid carriages which they have been prevented from using on footways by the provisions of traffic legislation but which they cannot always safely use on roadways. The Section removes these general restrictions and substitutes a flexible power to make special regulations relating to the characteristics of the vehicle (dimensions, weight, power unit, lighting system) and the conditions in which it can be used.

18. SECTION 21 relates to the scheme for the issue of car badges to disabled drivers, disabled passengers and institutions concerned with the care of the disabled. When brought into force, it will replace and extend the scope of the current yellow badge scheme for disabled drivers embodied in LWAL 2/67 and ROADS 32/67 issued by the then Ministry of Health and the Ministry of Transport

and locally with the departments responsible for traffic regulation in local authorities as defined in sub-section (8), who will remain free to seek advice (as they will often wish to do) from the health or welfare authority in matters which were previously their function.

19. All local authorities (as defined) will from the Appointed Day be under an obligation to organise the issue of car badges in respect of designated vehicles for disabled persons of prescribed descriptions and for institutions concerned with the care of the disabled and to maintain registers of the persons and institutions to whom the badges are issued.

Two sets of regulations will be made to give effect to the scheme. The first set will be the one provided for under sub-section (7). It will deal with the details of the scheme itself. The second set will be made under Section 84C of the Road Traffic Regulations Act 1967 and will lay down the circumstances in which exemptions for the vehicles of badge-holders shall be written into traffic regulation orders. In particular the latter set will provide for the recognition for exemption purposes in one local authority area of badges issued by another local authority, ie, the objective is that exemptions in local orders will apply to all vehicles displaying valid badges under the scheme irrespective of which authority has issued the badges. It is expected that badge-holders under the new scheme will continue to get the discretionary help that the police and traffic wardens often offer to disabled persons. Provision is made for a disabled driver or passenger to use the badge on one or more designated vehicles (though only a single badge is to be issued to each disabled person who applied for one, ie, the badge will be transferable from vehicle to vehicle) and for a badge to be issued for each vehicle used by institutions concerned with the care of the disabled to transport them. Badges are only to be displayed while the vehicle is being used to convey a disabled person or persons.

20. There is provision for transition from the existing to the new basis. But extensive consultation will be necessary before transfer of responsibility can be effected and the introduction of the new scheme will take time. Meantime, the existing basis will continue and responsibility for it will pass to social services departments if the Local Authority Social Services Act is in force before an Appointed Day Order under this Section has been made; but when that Order is made executive responsibility in the welfare or social services department will cease.

ACCESS TO BUILDINGS: PUBLIC SANITARY CONVENIENCES

21. SECTIONS 4-8 take the first statutory steps towards the removal of barriers to mobility and fuller participation in social and cultural life for all who rely on crutches or walking aids or wheelchairs and others who for a variety of reasons cannot easily manage steps or stairs.

22. SECTION 4 relates to the provision of buildings or premises to which the public are to be admitted. "Provision" is not defined in the Act. In its ordinary meaning it covers not only new construction but also the conversion of existing buildings. Public halls, public libraries, theatres, cinemas and shops are obvious examples of buildings to which the public are to be admitted. The University and school buildings expressly excluded from the operation of the Section by sub-section 2 are dealt with separately in Section 8.

23. The Section places an obligation on anyone undertaking the provision of buildings to which it relates to make provision for the needs of disabled persons in so far as it is in the circumstances both practicable and reasonable to do so. The provision is to be made in relation to both internal and external means of access and to any parking facilities and sanitary conveniences that are to be made available to the public visiting the building. So far as local authorities are concerned the Section in effect makes it mandatory to do what they were asked in MHLG Circular 71/65 to do on a voluntary basis, and have in many instances been doing already.

24. Where private development is concerned, local authorities are asked to take appropriate action to draw developers' attention to the Section, for example by a notice at the time when planning permission is granted; though the Section does not provide grounds on which planning permission or approval under the building regulations can be with-held.

25. SECTION 5 sub-section (1) lays a duty on local authorities when providing public sanitary conveniences to make provision for the needs of disabled persons so far as this is reasonable and practicable. Sub-section (2) requires that where public conveniences have already been, or are in future provided with special facilities for disabled persons the local authority concerned shall erect

"local authority" as a local authority within the meaning of the Local Government Act 1933 or any joint board or joint committee of which all the constituent authorities are local authorities within that Act.

26. Authorities who do not already comply with the intention of sub-section (1) will find technical guidance on the design of special compartments in public conveniences for use by handicapped people in MHLG Circular 33/68. This also contains advice on siting and other matters. Authorities are best able to judge where signposts or notices should be placed so as to be readily visible to disabled persons seeking to find a convenience with special facilities. Advice on the type of sign to be adopted can be obtained from "A Symbol for Disabled People: Symbol Application Manual", published by the Royal Institute of British Architects.

27. SECTION 6 applies to premises covered by Section 89 of the Public Health Act 1936 (viz, inns, public houses, beer-houses, refreshment houses or places of public entertainment). Under the latter provision the owner or occupier of such premises may be required by notice served on him by the local authority to provide and maintain in a suitable position such number of sanitary conveniences for the use of persons frequenting the premises as may be reasonable. The effect of Section 6 is that in complying with a Section 89 notice the owner or occupier is required to make provision for disabled persons using the premises so far as it is practicable and reasonable to do so.

28. To ensure that this obligation is not overlooked it is suggested that when serving a notice under Section 89 of the Act of 1936 an authority should at the same time draw the attention of the person to whom the notice is addressed to his obligation under Section 6. For technical advice on how sanitary conveniences can be designed for use by handicapped people he should be referred to MHLG circular 33/68 or the British Standards Institution Code of Practice CP96:Pt.1:1967.

29. SECTION 7 sub-section (1) requires that where special facilities for disabled persons are provided at a building in accordance with Section 4, 5 or 6 a notice or sign indicating that such facilities are available shall be displayed outside the building or in such a way as to be visible from outside it. Sub-section (2) ensures that the Section applies to sanitary conveniences provided otherwise than in a building.

30. In the case of public conveniences the requirement of Section 7 is additional to the requirement in Section 5 (under which directional signs have to be erected to indicate the whereabouts of the convenience). Advice on the type of sign which might be used to meet the requirements of either this Section or Section 5 is available in the manual referred to in paragraph 26.

31. SECTION 8 covers a wide variety of educational buildings. Local education authorities and others responsible for providing buildings for the purposes defined in sub-section (2) are required to make provision, so far as is practicable and reasonable, for the needs of disabled persons using the buildings, in the means of access both internally and externally and in the parking facilities and sanitary conveniences which may be available.

32. The use of an educational building by the disabled will vary according to its function, location and the extent to which it is likely to be used by the community. Many establishments of further education, for example, would not normally expect to have a significant number of students who are disabled but it is obviously important that any disabled people who wish to follow courses of further education should not be precluded from doing so. In relation to schools rather different considerations apply because special schools exist for boys and girls whose handicaps make it impracticable for them to attend ordinary schools. Nevertheless many less severely handicapped children can be satisfactorily educated in ordinary schools and benefit from mixing with the general run of their contemporaries. Designers of schools to be used extensively by the community should pay special attention to the requirements of the disabled.

33. Much can be done within existing cost limits to facilitate the use of buildings by the disabled. Among the special measures which might be adopted are the provision of at least one level entrance or, if necessary, a ramp instead of steps, and the provision of sufficient and suitable handrails. Within the building itself ramps may also be necessary. Lifts should be easy to operate and at least one WC compartment should be large enough to accommodate a person in a wheel-chair. The British Standards Institution Code of Practice CP96:Pt.1:1967 contains detailed advice on designing for the disabled.

barriers to mobility is more likely to be achieved if as much as possible is done to make those buildings which are now regularly open to the public more easily accessible to handicapped people. In some cases it may not be possible to do as much as would be desirable either because the structural design of the building does not permit or because the cost would be prohibitive. But in many buildings useful alterations can probably be affected at reasonable expense. Some authorities are known already to have taken action to improve access to their buildings or to have made other special arrangements to enable disabled persons to enter and use them. Those authorities who have not already done so are asked to take whatever action is practicable and reasonable to provide easier access and better facilities for the disabled. It may be possible for example to replace an entrance with steps by a ramp or to add handrails where appropriate. Inside the buildings better circulation can be obtained by widening doors so that a wheel-chair can pass through.

DUTIES OF HOUSING AUTHORITIES

35. SECTION 3 makes it plain that in carrying out their duties, including the duty with respect to general improvement areas, housing authorities must have regard to the housing needs of the disabled. The Section follows the report of the Housing Management Sub-Committee of the Central Housing Advisory Committee, entitled "Council Housing: Purposes, Procedures and Priorities", which has already been brought to local authorities' attention. This report emphasised the necessity for housing authorities to have a clearer, deeper and more detailed understanding of the changing housing situation in their areas, as otherwise they might find that they were catering for needs which had already been met or overlooking other needs not brought to their notice. Housing authorities will be expected to act in the spirit of the report in relation to the housing needs of the disabled as well as other needs.

36. Ministry of Housing and Local Government Circular 54/64 said that disabled persons can best be provided for in purpose-built dwellings and gave advice on designing such housing. Local authorities were advised to refer to the standard text book by Mr Selwyn Goldsmith*. Circular 54/64 also reminded housing authorities of the need to take into account at the design stage special features needed by wheel-chair users. These and other features needed by people with different disabilities are taken into account in calculating the subsidy payable under the Housing Subsidies Act 1967. Where a local authority is unable to provide specially designed housing for the disabled within the published yardsticks, they should apply to the Ministry for an ad hoc yardstick to be assessed, which will take into account any necessary higher costs. Where it is necessary for garages or car ports to be provided for use by disabled persons in purpose-built housing these items will be allowed exceptionally to rank for subsidy within the cost limits agreed by the Ministry.

THE QUALITY OF ADVICE

37. SECTION 15 reflects the special concern of Parliament that executive bodies over the whole local government field should take decisions on matters where the chronically sick and disabled have special needs on the basis of first-hand experience. Wherever a committee, to which co-option of non-members is required or permitted, is likely to take such decisions, the authority is required to consider the desirability of appointing someone with relevant experience, preferably someone with the direct personal experience of being himself (or herself) handicapped. Authorities will note that among such committees will be Social Services Committees (Sections 2-5 of the Local Authority Social Services Act 1970). But the interests of the chronically sick and disabled have properly been described as "as wide as life itself" and there can be few local government activities that do not concern them in some way; authorities are accordingly asked to interpret the Section in the broad sense of seeing that these interests are never overlooked. Authorities will no doubt wish to consult voluntary bodies in their areas with relevant interests when they are considering co-option in this context.

38. The concern of Parliament as to the quality of advice is similarly expressed in Sections 9-14 and 16, which deal with various advisory or executive bodies with which the Government are concerned.

* *Designing for the Disabled*, published by the Royal Institute of British Architects. A second revised and expanded edition of this book was published in 1967.

OTHER MATTERS

39. A number of matters were raised in debate which were not subsequently translated into legislation, including the interests of particular groups of health service patients. Authorities will observe that the theme of "Information" runs persistently through many Sections of the Act and it was further reflected in debate. An aspect to which importance was attached is the exchange of information, within proper limits of professional confidence, about the requirements of individuals and their families. There was also deeply felt concern that authorities themselves or their professional staffs, were or might be insufficiently informed about the whole range of possible forms of help that they themselves could give or that were available from others (aids and appliances were specially referred to). Flowing from this came suggestions for the improvement of professional training. The Government consider that any such matters are wholly for the bodies concerned with professional training but they will continue to take appropriate steps in their ordinary relationships with such bodies to keep the requirements of the chronically sick and disabled in mind. The most appropriate occasions are likely to occur in post-basic forms of training. Authorities will no doubt deep the general theme in mind when considering the content of in-service and staff development courses.

40. It was also argued that the ordinary living expenditure of the chronically sick and disabled is affected by costs (for clothing, linen, domestic equipment or travel, for example) which do not fall on others. Individual circumstances will of course vary between wide extremes and it would be impracticable to suggest a common measure of requirements or to legislate specially for such cases. But, wherever clients of an authority are required to make a payment for a service or facility (or are entitled to claim a rebate from their expenditure) and the authority in exercising its discretion in such matters takes account of the cash resources and requirements of such a person, authorities are invited to take into consideration any claim by a chronically sick and disabled person that he does, by reason of disability, incur abnormal expenditure and to make sure that clients know this and that they will do so. This is not to imply any diminution of the statutory powers of discretion of authorities to determine charges or waive them. Reference has already been made to the desirability of adjustment of rent rebate schemes to take account of the circumstances of handicapped people*.

41. CIRCULATION. Copies of this Circular are enclosed for the principal officers of the authority. A copy has been sent to the Local Government Training Board, and it is intended to send copies also to interested voluntary organisations. Additional copies may be obtained from:

The Clerk of Stationery
Ministry of Housing and Local Government
Queen Anne's Mansions
Queen Anne's Gate
London SW1.

Copies of the Act may be obtained from Her Majesty's Stationery Office.

Yours faithfully

A.S Marre

A S Marre
Second Permanent Under-Secretary of State,
Department of Health and Social Security

* Joint Circular from MHLG (46/67) and Welsh Office (41/67).

BRITISH STANDARD CODE OF PRACTICE
CP 96 : Part 1 : 1967
UDC 721.052 : 362.65

ACCESS FOR THE DISABLED TO BUILDINGS

PART 1 : GENERAL RECOMMENDATIONS

THE COUNCIL FOR CODES OF PRACTICE
BRITISH STANDARDS INSTITUTION

BRITISH STANDARD CODE OF PRACTICE
CP 96 : Part 1 : 1967

ACCESS FOR THE DISABLED TO BUILDINGS

PART 1 : GENERAL RECOMMENDATIONS

Price 10/- net

THE COUNCIL FOR CODES OF PRACTICE
BRITISH STANDARDS INSTITUTION
British Standards House, 2 Park Street, London, W.1

ACCESS FOR THE DISABLED TO BUILDINGS

Part 1. General Recommendations

This part of the Code of Practice has been prepared by a Committee convened by the Codes of Practice Committee for Building. Having been endorsed by the Council for Codes of Practice, it was published under the authority of the General Council on 14th August, 1967.

This Code of Practice makes reference to the following British Standards:

BS 2655. Electric lifts. Part 3. Outline dimensions.
BS .....* Indication signs for the use of buildings by disabled people.

* In course of preparation.

British Standard Codes of Practice are revised, when necessary, by the issue either of amendment slips or of revised editions. It is important that users ascertain that they are in possession of the latest amendments or editions.

The following BSI references relate to the work on this Code of Practice:
Committee reference BLCP/56 Draft for comment D65/10066

CODE DRAFTING COMMITTEE BLCP/56: ACCESS FOR THE DISABLED

Mr. Ronald Fielding (*Chairman*)

Mr. C. Wycliffe Noble†	*British Council for Rehabilitation of the Disabled*
Dr. F. S. Cooksey	*British Medical Association*
Lady Hamilton, O.B.E.	*Central Council for the Disabled*
Mr. C. L. Pocock	*Disabled Drivers' Association*
Mr. C. H. Gibbs	*Home Office*
Mr. O. A. Denly, M.B.E.	*Joint Committee on Mobility for the Disabled*
Mr. W. W. Garwood	*Ministry of Health*
Mr. P. Randall	*Ministry of Housing and Local Government*
Mr. T. W. Robinson	*Ministry of Pensions and National Insurance*
Mr. J. Johnston	*Ministry of Public Building and Works*
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Mr. J. H. Lidiard	*National Old People's Welfare Council*
Mr. Ronald Fielding	*Royal Institute of British Architects*
Mr. P. S. Goldsmith	*Royal Institute of British Architects*
Mr. C. Wycliffe Noble	*Royal Institute of British Architects*
Mr. M. W. Hudson*	*The Royal Institution of Chartered Surveyors*
Mr. E. J. Venn	*Royal National Institute for the Blind*
Mr. F. Collin Brown, C.B.E.	*Royal Society for the Promotion of Health*
Mr. C. P. Smart	*Spastics Society*
Dr. D. F. B. Roberts	*Nominated by OC/27* — *Advisory Committee on Anthropotometric Evidence for Equipment Dimensions*
Mrs. J. Ward	*Nominated by OC/27* — *Advisory Committee on Anthropotometric Evidence for Equipment Dimensions*

* Resigned 3-11-66.
† Replaced Mr. Peter MacIver 31-1-67.

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This Code of Practice represents a standard of good practice: compliance with it does not confer immunity from relevant legal requirements including regulation and byelaws.

BRITISH STANDARD CODE OF PRACTICE CP 96: PART 1

CCESS FOR THE DISABLED TO BUILDINGS

Part 1. General recommendations

FOREWORD

ıtil recently few buildings have been designed to meet the special requirements disabled people. As a consequence, existing buildings are often difficult and metimes impossible for disabled people to enter or to use. It is particularly portant, not only for disabled people who use wheelchairs but also for those o are ambulant, that step and staircase barriers should, wherever possible, avoided.

This Code is concerned specifically with accommodating the needs of sabled people and as a rule it should be noted that compliance with it will prove the convenience of any building for non-disabled users, and in particular r elderly people. It should also be noted that compliance with the Code may aterially contribute towards the avoidance of accident hazards in buildings.

The Code drafting committee is undertaking a comprehensive investigation the provisions for specific building types and these will be issued as subquent parts of this Code. They will be related to the disablement categories d design provisions contained in this document, and will detail the provisions ich need to be made in individual building types. In the light of the investigan of building types some of the general recommendations may be modified; ch modifications will be made either by the issue of amendments to Part 1 the Code or by a revised edition.

It is intended that the completed Code will cover those buildings which sabled people might wish to use for the purposes of employment, commerce, siness, transport, health and welfare services, refreshment, entertainment, orship, education or cultural activities. The communal areas of multi-dwelling sidential buildings will also be included, but individual dwelling units will be cluded.

The committee gratefully acknowledges 'Designing for the disabled' by lwyn Goldsmith, published by the Royal Institute of British Architects, ich provides technical details for the assistance of designers. Also the work ntributed by C. Wycliffe Noble, under the auspices of the Royal Institute of itish Architects' Rose Shipman Award, in the preparation of 'A study of ace requirements of wheelchair users'.

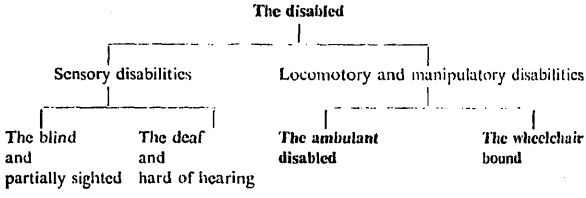
OTE. Where metric equivalents are stated the figures in British units are to be regarded standard. The metric conversions are approximate; more accurate conversions should be sed on the tables in BS 350, 'Conversion factors and tables'.

1. GENERAL

1.1 SCOPE

This Code details the architectural provisions which should be incorporated in new buildings to make them as convenient as possible for disabled and elderly people to use, so enabling such people to participate more easily in everyday activities. The general recommendations contained in this part may be applied to all buildings.

The types of disablement for which the Code caters are indicated on the following chart:



In this Code the word 'shall' indicates a requirement that is to be adopted in order to comply with the Code, while the word 'should' indicates a recommended practice.

1.2 TERMINOLOGY

For the purposes of this Code the terms used on the chart of disablement categories are defined and explained as follows:

The disabled. The disabled are those people who, as a consequence of physical disability or impairment, may be restricted or inconvenienced in their use of buildings because of:

(1) The presence of physical barriers, such as steps, or doors which are too narrow for wheelchairs.

(2) The lack of suitable facilities such as staircase handrails or grip rails beside w.c.'s.

Sensory disabilities. People with sensory disabilities are those who, as a consequence of blindness, deafness, impaired sight or impaired hearing may be restricted or inconvenienced in their use of buildings because of the lack of suitable facilities. The categories 'sensory disabilities' and 'locomotory and manipulatory disabilities' are not mutually exclusive. Many disabled people, particularly among the elderly, are included in both categories.

Locomotory and manipulatory disabilities. People with locomotory disabilities are those with disabilities which affect mobility, i.e. impairment of the trunk, lower limbs, or the trunk and lower limbs.

People with manipulatory disabilities are those with impaired function in one or both upper limbs, and who as a consequence may be restricted in their use of buildings because of the lack of suitable facilities, e.g. conveniently designed and located switches, controls and door handles.

Many disabled people with impaired lower limbs also have impaired upper limbs. To satisfy the requirements of such people account shall be taken simultaneously of the limitations imposed by both upper and lower limb impairment. In this Code people with manipulatory disabilities only, are automatically catered for wherever provision is made for those with locomotory disabilities.

For the purposes of this Code people with locomotory and manipulatory disabilities are categorized as either 'ambulant disabled' or 'wheelchair bound'. These are the two categories of disablement with which the Code is primarily concerned.

The ambulant disabled. Ambulant disabled people are those who are able, either with or without personal assistance, to walk on the level and negotiate suitable graded steps provided that convenient handrails are available.

The wheelchair bound. The wheelchair bound are those people who are unable to walk, either with or without assistance, and who, except when using mechanized transport, depend on a wheelchair for mobility.

Whilst being unable to walk, a minority of people in this group are not strictly chairbound, inasmuch as they are able to stand on their feet whilst transferring to and from a wheelchair.

1.3 AWARENESS OF FACILITIES

Where a building is designed in compliance with the Code the attention of building owners and building users should be drawn to the facilities available, in order that disabled people are made aware of the existence of suitable provisions for them, but it should be made clear that such provisions are not solely for their use.

To enable disabled people to locate suitable entrances, lifts and cloakroom accommodation signposting is recommended. Reference should be made to BS ....*.

2. GENERAL DESIGN PRINCIPLES

2.1 DESIGN CATEGORIES

Design provisions specific to the principal categories of disablement are given in Sections 3 and 4. These are listed under the headings: approach, access, internal circulation, and sanitary and cloakroom accommodation. For people with sensory disabilities provisions are given in Section 5. It is recommended that

* BS ...., 'Indication signs for the use of buildings by disabled people'. (In course of preparation.)

provisions should be incorporated in buildings to cater wherever possible for all disabled people.

When considering individual building types which will be contained in subsequent parts of this Code account will be taken of the varying requirements of different types of ambulant and chairbound disabled people. Recommendations will be made appropriate to the function of the building under consideration and the characteristics of the disabled people for whom it is required to cater.

2.2 IMPLEMENTATION OF THE CODE

Until recommendations in respect of individual building types are available provision for the disabled should be based on this Code. As a rule this will mean compliance with either Section 3 or Section 4.

The details given in 2.3 and 2.4 apply to all buildings where provision is to be made for disabled people. Those listed in 2.3 are recommendations but 2.4 is a requirement.

2.3 GENERAL RECOMMENDATIONS

The following should be observed wherever provision is made for disabled people in buildings.

2.3.1 Handrails. Handrails should be easy to grip (see Fig. 1). If circular a diameter not less than 1¾ in (45 mm) or more than 2 in (51 mm) is preferred.

2.3.2 Glazed doors. Frameless glass doors should have suitable markings or fittings to make the doors apparent. With double action swing doors the bottom of the vision panel should not be higher than 4 ft (1220 mm) above the floor level.

2.3.3 Spring closers to doors. Spring closers to doors should be adjusted so that the tension is reduced as far as possible. A resistance not exceeding 9 lbf ft (1·2 kgf m) is preferred for external doors, and 5 lbf ft (0·7 kgf m) for internal doors.

Where a door is in an exposed position and a heavy spring would otherwise be necessary, consideration should be given to the possibility of recessing the door or otherwise sheltering it from the prevailing winds.

2.3.4 Door ironmongery. Door handles should be easy to manipulate; where a door is latched a lever handle is preferred to a knob. The height of the handle should not be higher than 3 ft 6 in (1070 mm) above the floor level. Vertical or horizontal rails, where provided, should not be more than 1¼ in (32 mm) diameter.

2.3.5 Switches and controls. Switches and controls for light, heat, ventilation and fire alarms should not be higher than 3 ft 6 in (1070 mm) above the floor level

and should be easy to manipulate. Socket outlets should not be lower than 1 ft 6 in (455 mm) above the floor level. Toggles should project rather than be recessed.

2.3.6 Lift controls. Lift control buttons or switches should preferably be not lower than 3 ft (910 mm) or higher than 4 ft 6 in (1370 mm) above the floor level. A photo-electric cell to control the closing of the door is recommended.

Floor level indication should be provided in lift lobbies opposite and visible from lift doors.

2.3.7 Floor surfaces. Hazards at floor level, caused for instance by unnecessary projections, (e.g. door mats) unexpected variations in level and slippery surfaces, should be avoided.

2.3.8 Telephones. Selected telephone receivers for public use should not be higher than 3 ft (910 mm) above the floor level and should be accessible to wheelchair users.

2.4 PAVEMENTS

Where transfer has to be made from a vehicular surface to a pedestrian surface the road and pavement surfaces shall be blended to a common level, or the height of the kerb shall be reduced to not more than 1 in (25 mm) above the adjacent channel level. The gradient of any ramped surface should not exceed 1 in 10 (see Fig. 2).

3. DESIGN FOR THE AMBULANT DISABLED

3.1 GENERAL

Where provision in a building is to be made for ambulant disabled people 3.2 to 3.5 inclusive shall be complied with.

These relate to: approach (3.2), access (3.3), internal circulation (3.4), and sanitary accommodation (3.5).

3.2 APPROACH

3.2.1 The approach from the adjacent street or car parking area to at least one entrance shall be either level, ramped, in compliance with 3.2.2, or stepped, in compliance with 3.2.3.

3.2.2 Where the approach is ramped the following apply:

3.2.2.1 *Dimensions.* The gradient of the ramp should not exceed 1 in 12. Where the gradient exceeds 1 in 20 the length should not exceed 30 ft (9·1 m). The width shall not be less than 4 ft (1220 mm).

Where space is restricted short ramps of steeper gradient are permissible.

NOTE. Where such a ramp is used as a means of escape in case of fire the gradient may be limited by statutory regulations.

3.2.2.2 *Handrails.* A handrail not lower than 3 ft (910 mm) above ramp level should be fixed to the balustrade which is provided to the exposed side of any ramp or platform, i.e. where there is a vertical drop to the side. A similar handrail should be fixed to any wall surface adjacent to a ramp having a gradient exceeding 1 in 20.

3.2.2.3 *Alternative stepped approach.* Where the gradient of the ramp exceeds 1 in 12 an alternative stepped approach shall be provided which may or may not serve the entrance approached by the ramp. For such stepped approach the goings shall not be less than 11 in (280 mm) and the risers should be 6 in (150 mm) high, and shall not exceed 6½ in (165 mm). The goings and risers shall be of uniform depth and height and a handrail shall be provided to both sides of any such flight of steps.

3.2.3 Where the approach is stepped the following apply:

3.2.3.1 *Goings and risers.* Goings shall not be less than 11 in (280 mm). Risers should preferably be 6 in (150 mm) high and shall not exceed 6½ in (165 mm). Goings and risers in any flight shall be of uniform depth and height.

3.2.3.2 *Steps.* Steps should preferably be under cover.

3.2.3.3 *Total rise.* The total rise in any flight of steps should not exceed 4 ft (1220 mm).

3.2.3.4 *Handrails.* A handrail shall be provided at each side of any such flight of steps. Handrails should be extended at least 1 ft (305 mm) beyond the line of the nosing of the top step, and where possible, should similarly be extended beyond the bottom step.

3.3 ACCESS

3.3.1 Entrance door. At least one entrance door served by an approach complying with 3.2 shall not be less than 2 ft 9 in (835 mm) wide and shall give a clear opening width of not less than 2 ft 7 in (785 mm). Raised thresholds should be avoided

3.3.2 Revolving doors. Where revolving doors are installed an auxiliary side-hung door giving a clear opening width of not less than 2 ft 7 in (785 mm) shall be provided.

3.4 INTERNAL CIRCULATION

3.4.1 Lift. Where a lift is provided, the floor of the lift at entrance level should be at the same level as the entrance complying with 3.3.

3.4.2 Staircase. Where vertical circulation involves negotiation of steps the following shall be observed:

3.4.2.1 *Staircase gradient.* Accessible areas shall be served by a staircase, the risers of which shall not be more than 6½ in (165 mm) high, with a going of not less than 9½ in (240 mm). The treads and risers of each flight shall be of uniform depth and height. Each step should lap not less than ¾ in (20 mm) over the back edge of the step below (see Fig. 3). Nosings projecting more than 1 in (25 mm), and winders should be avoided.

3.4.2.2 *Total rise.* The total rise of any flight of consecutive steps should not exceed 6 ft (1830 mm)*.

3.4.2.3 *Open risers.* Open risers shall not be permitted to such staircases (see Fig. 3).

3.4.2.4 *Planning of top step.* The line of the nosing of the uppermost step of such a staircase should not be closer than 1 ft (305 mm) on plan, to the point where an adjacent wall returns (see Fig. 4).

3.4.2.5 *Handrails.* A handrail shall be provided at both sides of all such staircases. Handrails should be continuous around landings and should be extended not less than 1 ft (305 mm) on plan beyond the nosings of the top and bottom steps of any flight of steps, except that where there is no adjacent wall surface or where the return of a wall does not permit of 1 ft (305 mm) extension, the handrail should be extended as far as possible. A handrail should not be extended in a situation where it might be a hazard or cause an obstruction.

3.4.3 Corridors. Corridors and passageways shall not be less than 4 ft (1220 mm) wide. Any ramp should have a gradient not exceeding 1 in 12.

3.5 SANITARY AND CLOAKROOM ACCOMMODATION†

3.5.1 General. The provisions in a w.c. compartment, to cater for ambulant disabled people are listed in 3.5.2 and 3.5.3 and are illustrated in Fig. 5 and Fig. 6.

3.5.2 Requirements

3.5.2.1 *Grip rails.* Horizontal grip rails having a diameter not less than 1 in (25 mm) or more than 1¼ in (32 mm) shall be fixed to the side walls at a level 11 in (280 mm) above the w.c. seat, extending from a point not less than 11 in (280 mm) behind the front edge of the w.c. to a point not less than 1 ft 1 in (330 mm) in front of the w.c.

* A total rise of 6 ft (1830 mm) is permitted because such staircases are internal and are protected from the weather; for approach steps (see 3.2.3) which may not be under cover or protected the vertical rise should not exceed 4 ft (1220 mm).

† The provisions which follow, and also those in 4.5, are derived from an investigation made at the Nuffield Orthopaedic Centre, Oxford, in 1966. They are based on two w.c. plan arrangements recommended for further testing. When further tests have been carried out the provisions made here may be modified.

3.5.2.2 *Door.* The door to the w.c. compartment shall open out.

3.5.3 Recommendations

3.5.3.1 *Width of compartment.* The clear width between grip rails should be 2 ft 3 in (685 mm). The width of the compartment should be 2 ft 9 in (835 mm), except where a wash hand basin is installed when a wider compartment may be necessary.

3.5.3.2 *Grip rails.* Vertical grip rails should be fixed 1 ft 1 in (330 mm) in front of the w.c. (see Fig. 5) extending from a height 2 ft 9 in (835 mm) to 4 ft 3 in (1295 mm) above the floor level. Vertical and horizontal rails may be extended as shown in Fig. 5 and Fig. 6.

3.5.3.3 *W.C. seat.* The upper surface of the w.c. seat should be 1 ft 8 in (505 mm) above the floor level. The upper edge of the w.c. bowl should be approximately 1 ft 7 in (480 mm) above the floor level.

3.5.3.4 *Obstructions behind w.c.* The dimensions from the front edge of the w.c. seat to the rear wall or nearest obstruction should not be less than 2 ft 1 in (635 mm).

3.5.3.5 *Door.* The door should be fitted with a horizontal pull rail on the internal face at 3 ft 6 in (1070 mm) above the floor level. The door should be hinged on rising butts and provided with bales catch and swing-over indicator bolt. The door should not incorporate a penny in slot opening device, and should be openable from outside in the event of an emergency.

4. DESIGN FOR THE WHEELCHAIR BOUND

4.1 GENERAL

Where provision in a building is to be made for wheelchair bound disabled people 4.2 to 4.5 inclusive shall be complied with. These relate to: approach (4.2), access (4.3), internal circulation (4.4) and sanitary accommodation (4.5).

Compliance with these provisions will also ensure that ambulant disabled people are catered for, although attention is drawn to the second paragraph of 4.5.1.

4.2 APPROACH

4.2.1 The approach from the adjacent street or car parking area to at least one entrance shall be either level or ramped in compliance with 4.2.2 and in conformity with Fig. 7.

4.2.2 Where the approach is ramped the following apply:

4.2.2.1 *Dimensions, handrails, alternative stepped approaches.* These provisions are the same as for the ambulant disabled and 3.2.2 shall be observed.

4.2.2.2 *Kerbs.* A kerb not less than 2 in (51 mm) high shall be provided to the exposed side of any ramp or platform, i.e. where there is a vertical drop to the side.

4.2.2.3 *Platform at head of ramp.* Where the gradient of the ramp exceeds 1 in 12 a level platform, with a width and depth of not less than 4 ft (1229 mm) shall be provided at the head of the ramp.

4.2.2.4 *Foot of ramp.* There should be adequate visibility and turning space at the foot of any ramp.

4.3 ACCESS

4.3.1 Entrance door. At least one entrance door served by an approach complying with 4.2 shall not be less than 2 ft 9 in (835 mm) wide and shall give a clear opening width of not less than 2 ft 7 in (785 mm). Raised thresholds should be avoided but where essential they shall not be raised more than ¾ in (20 mm) above the level of the floor on both sides.

4.3.2 Revolving doors. Where revolving doors are installed an auxiliary side-hung door giving a clear opening width of not less than 2 ft 7 in (785 mm) shall be provided.

4.4 INTERNAL CIRCULATION

4.4.1 Internal doors. Areas which are to be accessible to the chairbound disabled shall be approached through doors giving a clear opening width of not less than 2 ft 7 in (785 mm). The unobstructed area adjacent to the door handle on the leading face of such doors should not be less than 1 ft 3 in (380 mm) wide (see Fig. 8).

4.4.2 Corridors. Corridors and passageways serving accessible areas shall not be less than 4 ft (1220 mm) wide.

4.4.3 Floor levels. Areas which are to be accessible to the chairbound disabled shall be at the same level as the entrance door complying with 4.3, or at the same level as the floor of a lift complying with 4.4.4 and 4.4.5. Where variations in level are unavoidable a ramp shall be incorporated, the gradient of which should not exceed 1 in 12. Where space is restricted short ramps of steeper gradient may be permissible.

4.4.4 Lift levels. Vertical circulation shall be by means of a lift in compliance with 4.4.5. At entrance level the floor level of the lift shall be at the same level as the entrance door complying with 4.3.

4.4.5 Lift dimensions. The minimum dimensions of lifts shall be as listed below and shall comply with BS 2655*.

	Platform dimensions		Internal dimensions of lift car		Entrance	
	width	depth	width	depth	clear width	type
8 person 1200 lb (550 kg) light traffic passenger lift	4 ft 9 in (1420 mm)	4 ft 1 in (1250 mm)	4 ft 5 in (1345 mm)	3 ft 8½ in (1120 mm)	2 ft 9 in (835 mm)	single sliding
8 person 1200 lb (550 kg) perambulator lift	3 ft 9 in (1140 mm)	5 ft 2 in (1580 mm)	3 ft 6 in (1070 mm)	4 ft 9¼ in (1455 mm)	2 ft 9 in (835 mm)	single sliding
10 person 1500 lb (680 kg) general purpose passenger lift	6 ft 0 in (1830 mm)	4 ft 0 in (1220 mm)	5 ft 9 in (1750 mm)	3 ft 7 in (1090 mm)	3 ft 0 in (910 mm)	two panel centre opening

4.5 SANITARY AND CLOAKROOM ACCOMMODATION

4.5.1 General. The provisions in a w.c. compartment to cater for chairbound disabled people are listed in 4.5.2 and 4.5.3 and are illustrated in Fig. 9 and Fig. 10. The lobby and approach to w.c. compartments and cloakrooms should be carefully planned to ensure adequate turning space for wheelchairs. The w.c. compartment illustrated in Fig. 5 and Fig. 6 is also suitable for some wheelchair users provided the depth of the compartment is not less than 5 ft 9 in (1750 mm).

The w.c. compartment shown in Fig. 9 and Fig. 10 will cater satisfactorily for many ambulant disabled people. Where provision is to be made in a cloakroom for the ambulant disabled this compartment may be provided in place of that detailed in 3.5. It should be noted that since some ambulant disabled people can more easily manage a narrow compartment with parallel rails it is desirable that the two types of compartment should be provided in combination where provision is to be made for both ambulant and chairbound disabled people.

The plan arrangement illustrated may be handed (laterally inverted) if preferred.

4.5.2 Requirements

4.5.2.1 *Levels.* The w.c. compartment shall be at the same level as an entrance door complying with 4.3 or at the same level as the floor of a lift complying with 4.4.4 and 4.4.5.

* BS 2655, 'Electric lifts', Part 3, 'Outline dimensions'.

4.5.2.2 *Wash hand basin.* A wash hand basin shall be provided inside the w.c. compartment, except that where space is severely restricted, a wash hand basin shall be provided adjacent to the w.c. compartment.

4.5.2.3 *Internal dimensions.* The depth of the compartment shall not be less than 5 ft 6 in (1675 mm), or 5 ft 9 in (1750 mm) where the width is 5 ft (1520 mm) or less. The width shall not be less than 4 ft 6 in (1370 mm).

The dimension from the centre line of the w.c. to the further side wall shall not be less than 3 ft 2 in (965 mm).

The dimension from the front edge of the w.c. to the rear wall shall not be less than 2 ft 6 in (760 mm).

4.5.2.4 *Grip rails.* Horizontal and vertical grip rails shall be provided in conformity with Fig. 9 and Fig. 10.

Rails shall not be less than 1 in (25 mm) or more than 1¼ in (32 mm) in diameter.

A horizontal rail shall be fixed parallel with the line of the w.c., extending from the rear wall to a point not less than 1 ft 1 in (330 mm) in front of the w.c. A second horizontal rail shall be fixed behind and at right angles to the w.c., extending from the junction with the first rail to a point not less than 1 ft 6 in (455 mm) measured from the centre line of the w.c. towards the further side wall. Both horizontal rails shall be fixed at a level 11 in (280 mm) above the w.c. seat.

A vertical rail shall be fixed in conformity with Fig. 9, at a point 1 ft 1 in (330 mm) in front of the w.c. and approximately 10 in (255 mm) from the centre line of the w.c. A second vertical rail shall be fixed at a point 1 ft 6 in (455 mm) from the centre line of the w.c. toward the further side wall. Vertical rails shall extend from a height 2 ft 9 in (835 mm) to 4 ft 3 in (1295 mm) above the floor level, and may be extended to floor and ceiling as shown in Fig. 10.

4.5.2.5 *Door.* The door to the w.c. compartment shall not be less than 2 ft 9 in (835 mm) wide.

The door shall open out, be hinged on the side further from the w.c., and be located in the position shown in Fig. 9. In exceptional cases the door may be located in the alternative position shown in Fig. 9, provided that the dimension from the inner face of the door to the wall opposite is not less than 5 ft (1520 mm).

4.5.3 Recommendations

4.5.3.1 *Wash hand basin.* The wash hand basin should be placed where it can be reached by a person seated on the w.c. It may be semi-recessed in the wall. A single lever action thermostatically controlled mixing valve is recommended.

The basin rim should be at 2 ft 8 in (810 mm) above the floor level.

4.5.3.2 *W.C. seat.* The upper surface of the w.c. seat should be 1 ft 8 in (505 mm) above the floor level. The upper edge of the w.c. bowl should be approximately 1 ft 7 in (480 mm) above the floor level.

4.5.3.3 *Accessories.* The w.c. flushing handle, toilet paper holder and towel fixture should be placed where they can be reached by a person seated on the w.c. Suggested locations are shown on Fig. 9 and Fig. 10.

4.5.3.4 *Door.* The door should be fitted with a horizontal pull rail on the internal face at 3 ft 6 in (1070 mm) above the floor level. The door should be hinged on rising butts and provided with bales catch and swing-over indicator bolt. The door should not incorporate a penny-in-slot opening device, and should be openable from outside in the event of an emergency.

4.5.4 Public lavatories. Where a w.c. compartment complying with 4.5.2 and 4.5.3 is planned as part of a public lavatory facility the following recommendations are made:

4.5.4.1 The w.c. compartment should be usable by a disabled man assisted by (e.g.) his wife or daughter, or by a disabled woman assisted by her husband or son. Because of this it is desirable that the w.c. compartment should, have an access independent of exclusively male or female areas, be controlled by an attendant, and be reserved for the use of disabled people only.

4.5.4.2 A pull cord or push button call should be installed so that assistance may be summoned from someone waiting outside, or in case of emergency from the attendant.

5. DESIGN FOR PEOPLE WITH SENSORY DISABILITIES

5.1 THE BLIND AND PARTIALLY SIGHTED

The principal requirements of the blind and partially sighted are as follows:

(1) A handrail should be provided to each side of any steps, staircase or ramp.

(2) Handrails should be extended beyond the top and bottom steps of any flight of steps, and beyond the top and bottom of any ramp.

(3) Winders, splayed steps and open risers to staircases should be avoided.

(4) Hazards at floor level, caused, for instance, by unnecessary projections or by unexpected variations in level, should be avoided.

(5) Frameless glass doors should be avoided.

Compliance with either of the principal categories of disablement as in Section 3 or Section 4 caters also for the blind and partially sighted, and no special additional provision is necessary where these are observed.

5.2 THE DEAF AND HARD OF HEARING

Provisions which should be incorporated in buildings to meet the special needs of the deaf and hard of hearing are as follows:

(1) Any audible alarm or indicator should be coupled with a visual aid such as a flashing light; such lights should be placed in strategic positions in the public areas of the building.

(2) For private offices without visibility to the public areas and occupied by deaf people a flashing light signal should be provided, wired back to the normal fire alarm system.

(3) In lift halls an illuminated sign indicating the arrival and direction of the lift should be incorporated.

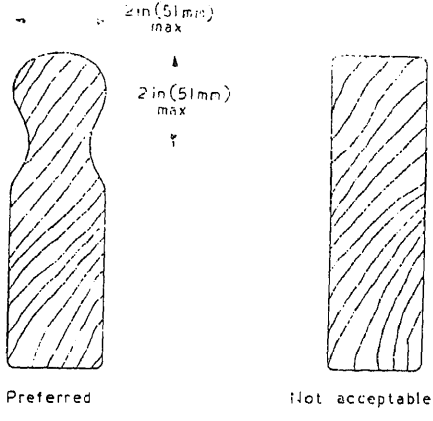


Fig. 1. **Suggested detail for handrail**

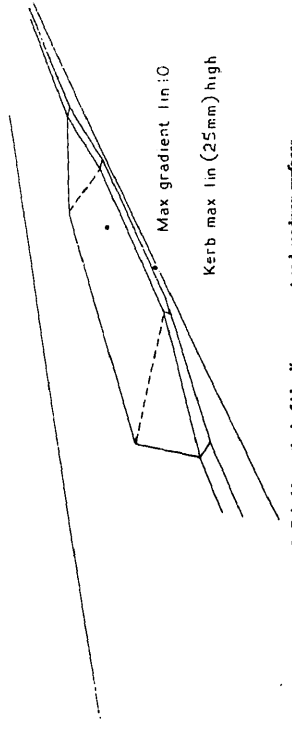


Fig. 2. Suitable method of blending pavement and roadway surfaces

Min. 9½in(240mm)
Max 6½in(165mm)
1in(25mm)
1 Recommended
Projecting nosings
2 Not recommended with projections more than 1in(25mm)
Open risers
3 Not permitted

Fig. 3. Stairs

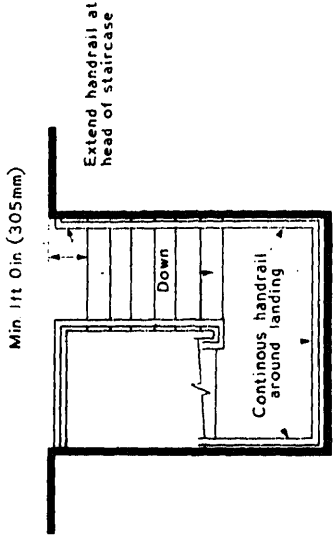


Fig. 4. Example of staircase plan for ambulant disabled

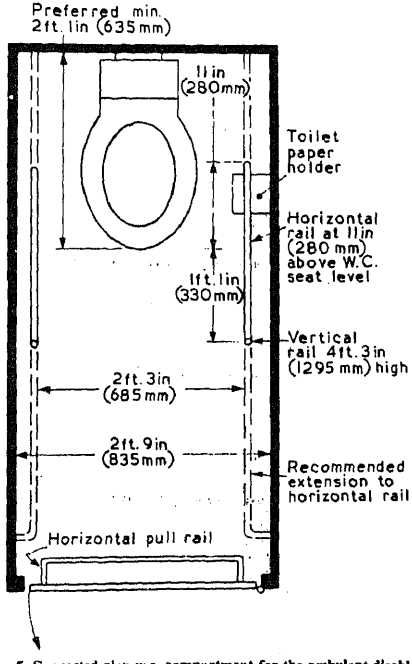


Fig. 5. Suggested plan w.c. compartment for the ambulant disabled

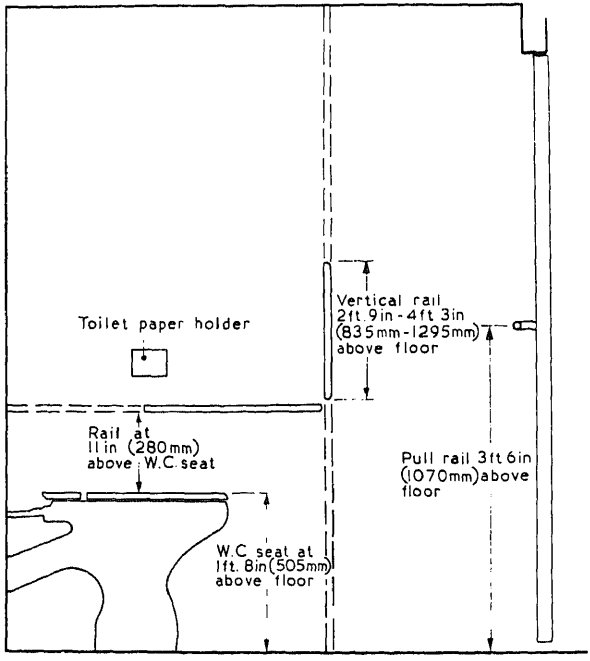


Fig. 6. Section through w.c. compartment for the ambulant disabled

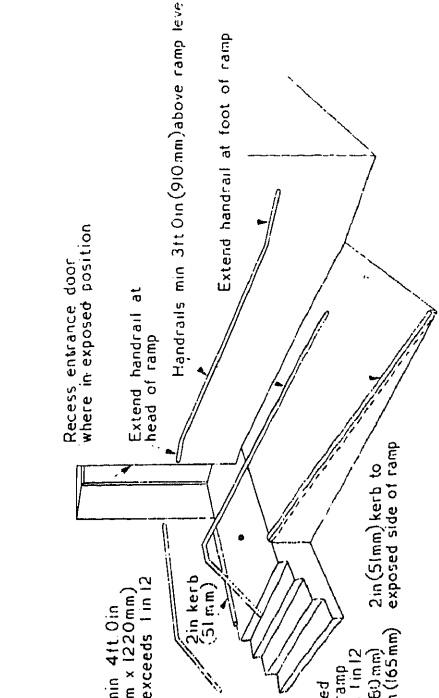


Fig. 7. Example of ramped approach

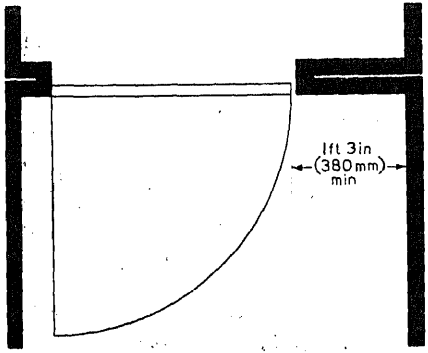


Fig. 8. Plan of doors suitable for the wheelchair bound

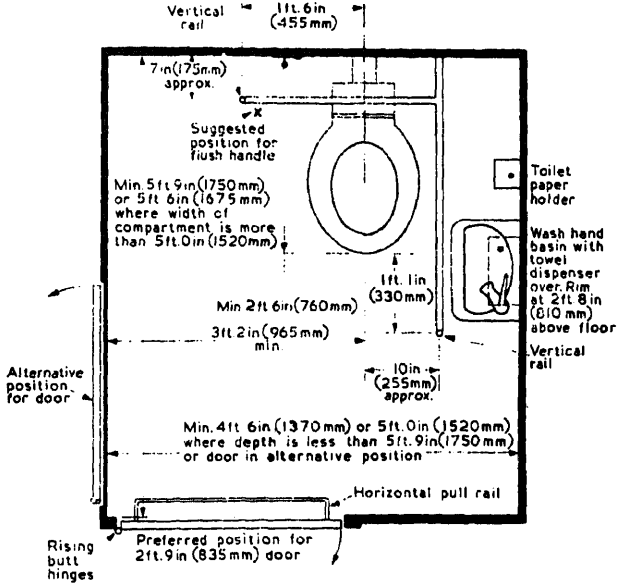


Fig. 9. Suggested plan w.c. compartment for the wheelchair bound

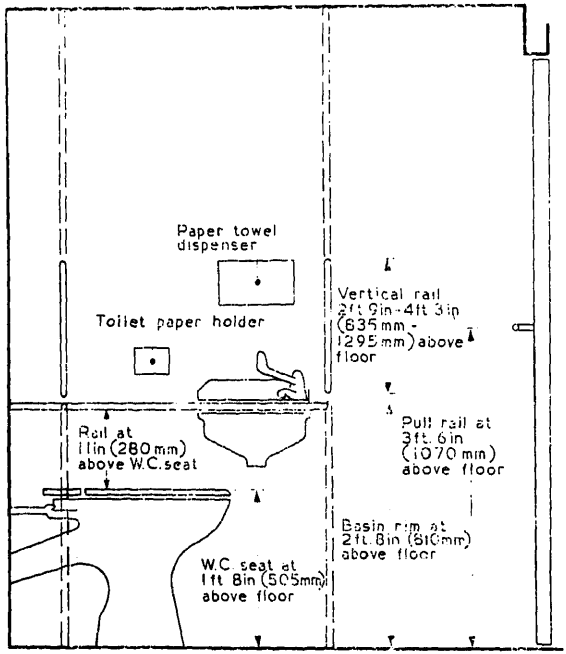
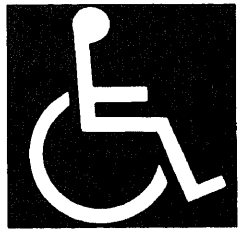


Fig. 10. Section through w.c. compartment for the wheelchair bound

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for the
HANDICAPPED
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PREFACE

One in every seven Canadians has an infirmity associated with aging or a permanent, physical disability

Stairs, door and corridors of insufficient width frequently become barriers that prevent handicapped persons from participating fully in family and community life. Building Standards for the Handicapped, a Supplement to the National Building Code of Canada, is designed to eliminate such barriers and allow handicapped persons to enter and use buildings without assistance. The application of these Standards in the construction or alteration of buildings used by the public will greatly facilitate the mobility of the physically handicapped.

This edition of the Supplement is written in a form suitable for adoption as legislation, and contains detailed requirements to augment the following requirements in the National Building Code 1975:

(a) Subsection 3.2.7. "Provisions for Physically Handicapped Persons,"
(b) Article 3.6.4.5. which regulates the provisions of public washrooms for physically handicapped persons, and
(c) Articles 9.9.2.10. and 9.9.2.11. which regulate access requirements in buildings falling within the scope of Part 9 of the National Building Code.

These NBC requirements are set out in full in Appendix A. Appendix B contains supplementary material and diagrams to assist the designer.

The first line of each item in Appendix B contains in bold-face type a reference to the requirement to which the supplementary material is applicable. These references have been placed in numerical order to ensure that they are easily found when they are referred to in the text.

The recommendations contained herein are based on average needs and acceptable norms, with wheelchair use being the most limiting design condition. Where particular disability problems are concerned, this document should be used only as a general guide.

The implementation of these Standards will not detract from the normal use of buildings by those who are not handicapped, but will make buildings more accessible and safer for all who use them.

Le Code national du bâtiment, ses suppléments et les documents qui s'y rattachent sont disponibles en français. On peut se les procurer en s'adressant au Secrétaire, Comité associé du Code national du bâtiment, Conseil national de recherches du Canada, Ottawa, Ontario K1A 0R6.

SECTION 1 SCOPE

SUBSECTION 1.1 GENERAL

1.1.1. These Standards apply to the design of buildings for use by physically handicapped persons.

1.1.2. In designing buildings to accommodate physically handicapped persons, the designer shall take into consideration the limitations of persons in wheelchairs regarding the dimensions of such chairs, the room necessary for manoeuvring them and the reach of the persons in them. (See Appendix B.)

SECTION 2 SITE DEVELOPMENT

SUBSECTION 2.1 WALKS (See Appendix B.)

2.1.1. Walks that are required to be designed to accommodate physically handicapped persons shall conform to Articles 2.1.2. to 2.1.5. (See also Subsection 3.2.7. and Article 9.9.2.9. of the National Building Code of Canada 1975.)

2.1.2. Exterior walks shall have nonslip surfaces.

2.1.3. Exterior walks shall form a continuous surface and shall not have abrupt changes in level such as steps and curbs.

2.1.4. Exterior walks shall be at least 3 ft in width.

2.1.5. Where the gradient of a walk exceeds 1 in 20 it shall be designed according to the requirements for a ramp. (See Article 3.3.1.)

SUBSECTION 2.2 PARKING AREAS (See Appendix B.)

2.2.1. Where parking spaces are required to be provided for physically handicapped persons, such spaces shall be at least 12 ft wide, hard surfaced and level, located close to an entrance, and shall be identified for the use of physically handicapped persons.

SECTION 3 BUILDINGS

SUBSECTION 3.1 ENTRANCES (See Appendix B.)

3.1.1. At the entrance to a building, doorways and ramps required to be designed to accommodate physically handicapped persons shall conform to Subsections 3.2 and 3.3, respectively.

3.1.2. Vestibules required to be designed to accommodate physically handicapped persons, including those in toilet rooms, shall be designed to allow movement of a wheelchair between the doors.

3.1.3. Where a building is required to have a principal entrance to accommodate physically handicapped persons, signs shall be installed where necessary to indicate the location of the principal entrance that is suitable. (See Appendix B.)

3.1.4. Where a facility is required to be designed to accommodate physically handicapped persons, such facility shall be identified by a sign consisting of the International Symbol of Accessibility for Handicapped Persons and such other graphic or written directions as are needed to indicate clearly the intended facility. (See Appendix B.)

SUBSECTION 3.2 DOORS AND DOORWAYS (See Appendix B.)

3.2.1. Except as required in Subsection 4.3, doorways required to be designed to accommodate physically handicapped persons shall have a clear opening, free of protruding hardware, of at least 2 ft 6 in. when the door is in the open position.

3.2.2. Thresholds that are not flush with the floor in doorways that are required to be designed to accommodate physically handicapped persons shall not exceed ½ in. in height, and shall be sloped to facilitate the passage of wheelchairs.

3.2.3. Door closers shall be of a type that permits opening the door with a minimum of effort and that is slow closing to allow uninterrupted passage of a wheelchair. (See Appendix B.)

SUBSECTION 3.3 RAMPS (See Appendix B.)

3.3.1. Where ramps are required to be designed to accommodate physically handicapped persons, the ramps shall conform to the requirements of Articles 3.3.2. to 3.3.8.

3.3.2. Ramps shall have a nonslip surface.

3.3.3. Ramps shall have a minimum width of 3 ft.

3.3.4. Gradients for ramps shall be in accordance with Sentence 3.4.8.8.(1) and Article 9.8.6.1. of the National Building Code of Canada 1975, except that the gradients for ramps shall not exceed 1 in 7.

3.3.5. A level area of 5 ft by 5 ft shall be provided at the bottom of a ramp.

3.3.6. On the top of a ramp leading to a door, a level area of at least 5 ft by 5 ft shall be provided so that at least 1 ft projects beyond the latch edge of the door opening, except that where the door opens away from the ramp, the depth of the level area may be reduced to 3 ft. (See Appendix B.)

3.3.7. Where there are abrupt changes in the direction of a ramp, or where the ramp exceeds 30 ft in length, it shall have a level landing at intervals of not more than 30 ft measuring at least 4 ft long and of at least the same width as the ramp.

3.3.8. All ramps and landings shall be equipped so they can be illuminated to average levels of at least 5 foot candles at floor level.

SUBSECTION 3.4 HANDRAILS (See Appendix B.)

3.4.1. Except as provided in Article 3.4.2., ramps shall have a handrail on at least one side which shall extend at least 1 ft beyond the top and bottom of the ramp. This extension shall be located so that it does not constitute a hazard. (See also Sentences 3.4.8.6.(1) to (4) of the National Building Code of Canada 1975.)

3.4.2. Ramps with a gradient steeper than 1 in 12 shall have 2 handrails spaced approximately 2 ft 10 in. apart.

SUBSECTION 3.5 ELEVATORS

3.5.1. Where elevators are required to be designed to accommodate physically handicapped persons, the requirements of Articles 3.5.2. and 3.5.3. shall apply.

3.5.2. The uppermost button in the elevator cab control panel shall be located not more than 5 ft

SUBSECTION 3.6 SPECIAL TOILET ROOMS

3.6.1. Transportation terminals that may be used by patients in transit or other handicapped persons that may require an attendant shall be provided with a special toilet room conforming to the requirements of Articles 3.6.2. to 3.6.7., unless specifically exempted by the authority having jurisdiction. Such toilet room may also be considered to meet the requirements for a washroom for physically handicapped persons in Subsection 3.7.

3.6.2. Doors to the special toilet rooms referred to in Article 3.6.1. shall be capable of being locked from the inside.

3.6.3. Special toilet rooms shall contain at least 1 water closet conforming to Subsection 3.8 and 1 lavatory conforming to Subsection 3.9 which are accessible to and usable by physically handicapped persons. The water closet shall be equipped with a grab bar conforming to Articles 3.7.6. and 3.7.7.

3.6.4. Where vestibules are provided, doors in vestibules shall conform to Articles 3.2.1. and 3.2.2.

3.6.5. Special toilet rooms shall be at least 50 sq ft in size with no dimension less than 5 ft 6 in.

3.6.6. Fixture clearance shall conform to the requirements in Subsections 3.7 to 3.9 inclusive.

3.6.7. The door to the special toilet room shall be identified for use by physically handicapped persons. (See Appendix B for Article 3.1.4.)

SUBSECTION 3.7 WATER CLOSET STALLS (See Appendix B.)

3.7.1. Where a washroom is required to be installed for use by physically handicapped persons, at least 1 water closet stall shall conform to Articles 3.7.2. to 3.7.8.

3.7.2. Water closet stalls shall be at least 4 ft 6 in. in width by 5 ft in depth.

3.7.3. The water closet stall door shall be a minimum of 2 ft 8 in. in width and shall swing outward.

3.7.4. Except as provided in Article 3.7.5., the water closet shall be located at least 1 ft 6 in. from the centre of a fixture to an adjacent side wall.

3.7.5. At least 3 ft shall be provided from the centre line of a water closet to an adjacent wall on at least 1 side of the water closet.

3.7.6. The water closet stall shall be provided with a grab bar conforming to Article 3.7.7.

3.7.7. Grab bars shall have a diameter of not less than 1 in. and not more than 1¼ in., with at least 1¼ in. of space between the bar and the wall. Such grab bars shall be mounted at the side of the water closet approximately 1 ft 4 in. from the centre line of the water closet.

3.7.8. A coat hook with rounded edges shall be mounted 5 ft above the floor on a side wall, projecting not more than 1 in. from the wall.

SUBSECTION 3.8 WATER CLOSETS (See Appendix B.)

3.8.1. Where a water closet stall is installed for use by physically handicapped persons, at least 1 water closet in such stall shall conform to Articles 3.8.2. to 3.8.5.

3.8.2. Water closet seats shall not exceed 1 ft 6 in. in height above floor level.

3.8.3. Water closet seats with spring-up action shall not be used.

3.8.4. Flushing controls shall be hand operated and easily accessible to a wheelchair user.

3.8.5. A back support shall be provided for each water closet.

SUBSECTION 3.9 LAVATORIES

3.9.1. Where a washroom is required for use by physically handicapped persons, an accessible lavatory shall be installed in conformance with Articles 3.9.2. to 3.9.5.

3.9.2. Lavatories shall have a clearance of at least 2 ft 2 in. beneath the bottom of the lavatory to a point at least 10 in. in from its front.

3.9.3. Waste outlet pipes which constitute a burn hazard shall be insulated.

3.9.4. Lavatory faucet handles shall be of the lever type.

3.9.5. Lavatories shall be mounted a minimum of 1 ft 6 in. from the side wall to the centre of the fixture.

SUBSECTION 3.10 PUBLIC TELEPHONES

3.10.1. Public telephones provided for use by physically handicapped persons shall meet the requirements of Articles 3.10.2 to 3.10.5.

3.10.2. The booth or enclosure shall be located so that it can be entered by a person in a wheelchair, and shall be suitably identified for use by physically handicapped persons.

3.10.3. The dial, handset and coin deposit slots shall be mounted not more than 4 ft above the floor.

3.10.4. The telephone shall be equipped with an amplifier on the receiver.

3.10.5. A telephone directory shelf shall be mounted not less than 30 in. above the floor.

SECTION 4 DWELLING UNITS

SUBSECTION 4.1 GENERAL (See Appendix B.)

4.1.1. Dwelling units required to be designed for the use of physically handicapped persons shall conform to Articles 4.1.2. to 4.15.1.

4.1.2. All living areas and essential facilities in and related to the dwelling unit shall be accessible to persons in wheelchairs.

SUBSECTION 4.2 ENTRANCES

4.2.1. At least 1 entrance to each dwelling unit shall be designed for use by persons in wheelchairs.

SUBSECTION 4.3 DOORS AND DOORWAYS

4.3.1. Doorways at the entrance to the dwelling unit and at the entrance to each room shall conform to Article 3.2.1., except that where doors or openings lead off a hallway at right angles, such doors or openings shall be at least 3 ft in width. All other doorways shall provide a clear opening of at least 2 ft 6 in. in width.

SUBSECTION 4.5 KITCHENS (See Appendix B)

4.5.1. A clearance of at least 4 ft 6 in. shall be provided in front of base cabinets, work surfaces, counter tops and appliances.

4.5.2. Knee space shall be provided under the sink to accommodate persons in wheelchairs.

SUBSECTION 4.6 BATHROOMS (See Appendix B)

4.6.1. Bathrooms shall be designed to allow access by a person in a wheelchair to each fixture.

4.6.2. The access area to a bathtub shall be at least 2 ft 6 in. wide by 3 ft 6 in. in length to allow for parallel placement of a wheelchair.

4.6.3. Clearance at one side and in front of a water closet shall be at least 2 ft 6 in.

4.6.4. Lavatories shall have a clearance of 2 ft 2 in. under the bowl to a point at least 10 in. from the front of the fixture.

4.6.5. Lavatory faucet handles shall be of the lever type.

4.6.6. Waste outlet pipes which may constitute a burn hazard shall be insulated.

4.6.7. Where a shower is installed as a separate fixture, the shower stall shall be at least 3 ft wide by 4 ft deep. The sill of such stalls shall be designed to permit easy entrance of a wheelchair.

4.6.8. Grab bars shall be provided at the water closet, bathtub and shower and shall be adequately anchored.

SUBSECTION 4.7 CLOTHES CLOSETS

4.7.1. Floors in clothes closets shall be at the same level as the floor of the room they serve.

SUBSECTION 4.8 BEDROOMS (See Appendix B)

4.8.1. At least 1 bedroom shall be specially designed to allow free movement of a wheelchair within the bedroom.

SUBSECTION 4.9 LAUNDRY FACILITIES

4.9.1. A clearance of at least 4 ft 6 in. shall be provided in front of laundry tubs, automatic washers and dryers.

SUBSECTION 4.10 GARAGES, CARPORTS AND PARKING SPACES

4.10.1. A garage, carport or parking space serving a dwelling unit required to be designed to accommodate physically handicapped persons shall be designed to accommodate wheelchairs. (See Appendix B for Section 2, Site Development.)

4.10.2. The clear inside width of a garage or carport to accommodate 1 car shall be at least 12 ft.

SUBSECTION 4.11 WALKS

4.11.1. Walks shall have a width of at least 3 ft with a gradient of not more than 1 in 20, constructed without steps or abrupt changes in level.

SUBSECTION 4.12 RAMPS

4.12.1. Ramps shall conform with the requirements of Subsection 3.3.1.

SUBSECTION 4.13 CONTROLS

4.13.1. Controls for lights, cooking, heating and ventilation equipment, windows, draperies and all similar controls of frequent or essential use shall be placed within reach of persons in wheelchairs. (See Appendix B for Subsection 4.5.)

4.13.2. Electrical receptacles shall be at least 1 ft 6 in. above the floor.

SUBSECTION 4.14 WINDOWS

4.14.1. Openable windows shall be designed and located so that they can be easily opened by a person in a wheelchair. Opening mechanisms shall allow easy operation.

SUBSECTION 4.15 SHARED FACILITIES

4.15.1. Shared recreation and service facilities in multi-family occupancies shall be accessible to persons in wheelchairs.

APPENDIX A

EXTRACTS
from the
National Building Code of Canada 1975

(This Appendix contains the requirements for building standards for the handicapped from the National Building Code of Canada 1975.)

EXTRACTS FROM THE NATIONAL BUILDING CODE OF CANADA 1975

Public building (as applied to requirements for the design of *buildings* for physically handicapped persons) means a *building* to which the public is admitted, but does not include apartment *buildings*, houses, boarding houses or *buildings* of Group F *major occupancy* or *buildings* of Group D *major occupancy* of a single tenancy.

(Details of occupancies can be found in Part 3 of the National Building Code of Canada 1975.)

3.2.7.1. Every *public building* shall have at least 1 principal entrance designed in conformance with NBC Supplement No. 5, "Building Standards for the Handicapped 1975," for use by physically handicapped persons, opening to the outdoors at sidewalk level or to a ramp leading to a sidewalk.

3.2.7.2. Every *public building* shall provide access for physically handicapped persons from the entrance described in Article 3.2.7.1. to public spaces on the entrance floor, and to at least 1 elevator where elevators are provided.

3.2.7.3. Washroom facilites in *public buildings* shall conform to Article 3.6.4.5.

(Where *buildings* are designed to accommodate handicapped persons, the requirements in NBC Supplement No. 5, "Building Standards for the Handicapped 1975" may be used as a guide for facilities in addition to the facilities required in this Bylaw.)

3.6.4.5. In every *public building* where washrooms are provided for the public, at least 1 washroom shall be provided that is designed for and is accessible to physically handicapped persons in conformance with the appropriate provisions in NBC Supplement No. 5, "Building Standards for the Handicapped 1975."

9.9.2.10. Every *public building* shall have at least 1 principal entrance designed in conformance with NBC Supplement No. 5, "Building Standards for the Handicapped 1975," for use by physically handicapped persons, opening to the outdoors at sidewalk level or to a ramp leading to a sidewalk.

9.9.2.11. Every *public building* shall provide access for physically handicapped persons from the entrance described in Article 9.9.2.10. to public spaces on the entrance floor, and to at least 1 elevator when elevators are provided in conformance with NBC Supplement No. 5, "Building Standards for the Handicapped 1975."

APPENDIX B

SUPPLEMENTARY MATERIAL
for
Building Standards
for the Handicapped 1975

(This Appendix contains notes and diagrams that apply to the requirements of this Supplement. The bold-face reference numbers that introduce each item apply to the requirements in the main body of the Supplement to which this material is applicable. The bold-face captions following these reference numbers describe the subjects to which the references apply.)

Article 1.1.2. General Information on Designing for the Physically Handicapped

Designing for Children

The dimensions given are for adults of average stature. In designing buildings for use by children, it may be necessary to alter some dimensions such as height of handrails, according to the age group.

Wheelchair Dimensions

The dimensions of standard models of wheelchairs vary as follows:

Length	38½ to 41½ in.
Width when open	24 to 27¼ in.
Width when collapsed	9½ to 12 in.
Height of seat from floor	19¼ to 20½ in.
Height of armrest from floor	28 to 30 in.
Height of rear pusher handle from floor	35 to 37½ in.

Functioning of a Wheelchair

The average space required for turning through 180 deg. is 5 ft by 5 ft. A minimum width of 5 ft is required for 2 wheelchairs to pass each other.

Functioning of an Adult in a Wheelchair

The upward reach from the floor ranges from 54 in. to 78 in.; the average reach is 69 in. The average horizontal working reach at a bench or table is 18 in. beyond the front of the working surface. The horizontal reach, with each arm extended to the side shoulder high, ranges from 54 in. to 71 in. The average reach is 64.5 in. In reaching forward, as when using a wall-mounted dial telephone, the average person can reach 48 in. On some models of wheelchairs the arm rests are removable, and a person may transfer horizontally to a car, water closet or bed.

Section 2. SITE DEVELOPMENT

Almost any building can be made accessible to physically handicapped persons by planning the site, so that terraces, retaining walls and winding walks are used effectively. An accessible route should exist from the sidewalk or roadway and parking area to an accessible building entrance. This route should be located so that physically handicapped persons do not have to pass behind parked cars. Particular attention should be paid to the junction of walkways with driveways, parking areas and other walks. The provision of nonslip surfaces on steps, walks and floors greatly assist those with semi-ambulatory disabilities.

Article 2.1.4.

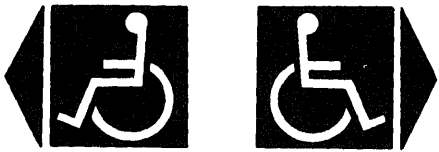
Although the minimum width for walks is 3 ft, it is highly desirable that, where space allows, they be 5 ft in width to allow wheelchair users to pass each other.

Subsection 3.1 Buildings

As much of the building as possible should be accessible to physically handicapped persons, especially areas used by the public. Special attention should be given to the accessibility of entrances, washrooms and elevators. The International Symbol of Accessibility for Handicapped Persons was adopted in 1969 by the International Society for the Rehabilitation of the Disabled to indicate that building services are accessible to the physically handicapped.

Article 3.1.3.

This symbol when displayed on a building indicates to physically handicapped persons that they will have reasonable freedom of movement within that building. An arrowhead can be added to either side of the symbol to indicate direction or the location of an accessible ground level entrance.



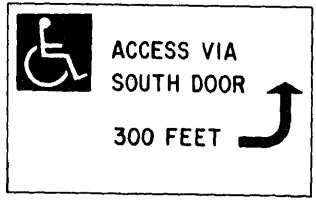
Article 3.1.4.

These symbols can be used to notify physically handicapped persons that rest room and other facilities that are so marked have been made accessible to them, and to indicate their location.



The background (shown here as black) is blue in the official symbol, but for aesthetic purposes different colours can be used. Where the colour will not be clear when the sign is in position because of lighting conditions, for example, the sign can be centred on a white background made from self-adhesive decorator vinyl covering, which adheres to glass and is waterproof. The design of the symbol allows for easy reproduction in many building materials.





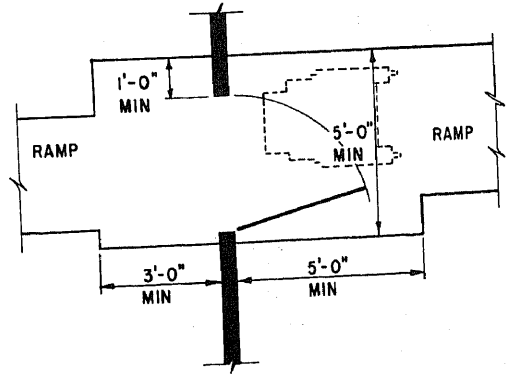
Subsection 3.2 Doors and Doorways

Doors that require little strength to operate, have an easily gripped handle, are reasonably wide and do not have a threshold can be safely used by most people. Space for wheelchair manoeuvring should be provided on both sides of the door. Door handles should be of the lever type.

Subsection 3.3 Ramps

A change in the level of a walk or floor area becomes a major problem for people with physical disabilities. Flat surfaces are desirable, but if a change in level occurs, a ramp of low slope should be used. As the slope of the ramp decreases, the number of people who can safely use the ramp increases; a slope of 1 in 12 is the suggested maximum. Provision of a nonslip surface at all times is essential. Where a ramp is located outside a building, it should be protected from snow and ice accumulation by providing a roof, snow melting device or other means.

Article 3.3.6 Level Areas at End of Ramps Leading to Doorways

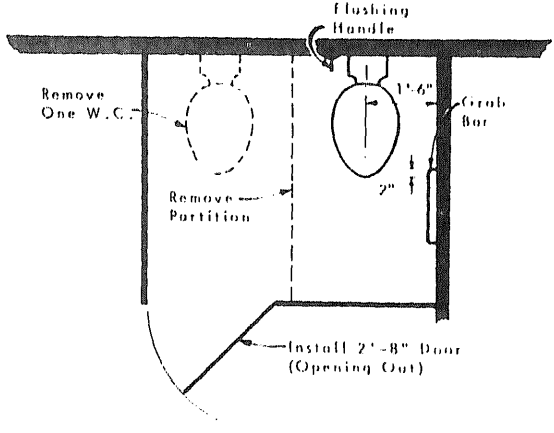


Subsection 3.4 Handrails

Although Article 3.4.1. permits a handrail on only one side if the ramp slope is 1 in 12 or less, it is preferable to have handrails on both sides regardless of slope.

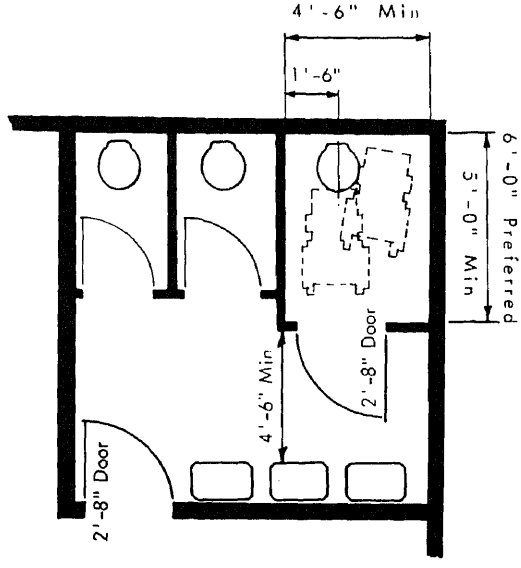
Subsection 3.7 WATER CLOSET STALLS

Water closet stall doors should preferably swing outward against a side wall. In existing buildings, water closet stalls for persons with physical disabilities can be provided by combining 2 standard water closet stalls into 1 by removing the common partition and fitting a suitable door.



Conversion of 2 standard water closet stalls to 1 for the physically handicapped

Subsection 3.7 (Cont'd.)



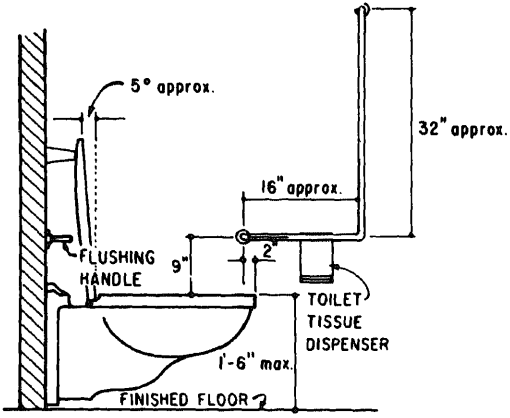
Plan view of water closet stall

Subsection 3.8 Water Closets

Wall-mounted toilet fixtures or floor models with receding bases are desirable because they provide the least amount of obstruction.

The back support required in Article 3.7.5. may be of a fixed type or can be provided by the seat lid. It should be fixed or should rest approximately 5 deg. from the vertical.

ection 3.8 (Cont'd.)



Toilet fixture and grab bar arrangement

ection 4.1 General (Dwelling units)

A single-storey dwelling with the floor close to grade level is the most efficient type of house or the handicapped. Unless the basement is accessible to the non-ambulatory person, facilities of frequent use such as the laundry should be located on the main floor.

t is essential that the finish of all floors should have nonslip qualities even when standard ooring materials are used. Highly polished finishes should be avoided. Particular attention hould be given to the selection of materials used on vestibule and entrance hallway floors as hese may become dangerous when wet. A minimum of wax should be used on the maintenance of floors to prevent surplus amounts being transferred to the soles of shoes. Nonslip waxes containing fine abrasive particles are recommended. Any temporary floor covering naterial should be of a kind that does not constitute a tripping hazard.

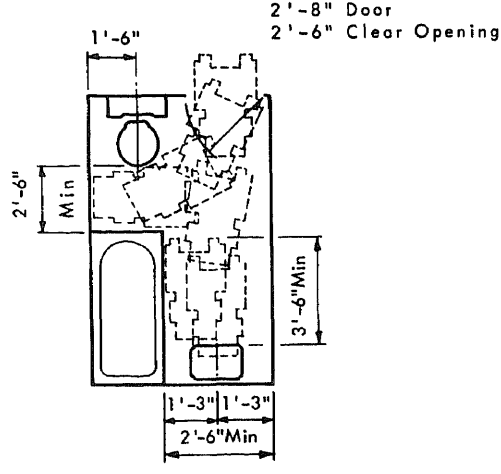
Carpet flooring should be compact with a dense surface of loop pile or felt type, and should e attached to subsurfaces so as to allow wheelchairs to move freely without excessive friction, bunching or binding.

ection 4.5 Kitchens

liding doors are preferable for kitchen cabinets. A work surface can be provided by a cutng board located at a suitable level. Kitchen shelving should be adjustable so as to accomodate different individuals. Where kitchen ranges are provided, the controls should be ccessible without having to reach over the burners or elements.

Subsection 4.6 BATHROOMS

There are many ways of arranging the fixtures in a bathroom, depending on the shape and total floor space available. The following plan is used only to show the minimum distances that one fixture should be from another fixture or from a wall.



Typical bathroom layout in a dwelling unit showing minimum clearances necessary for access to fixtures by a wheelchair

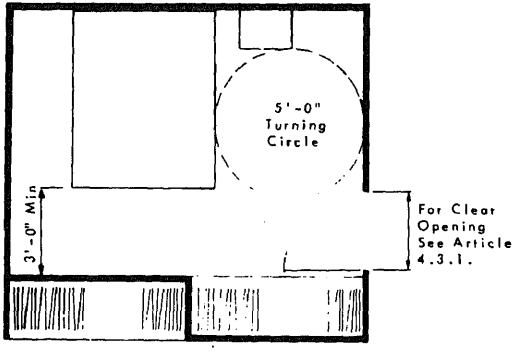
Grab bars must be designed so they can be securely attached to the framing members. In new construction their location should be determined before the interior cladding is completed so that adequate backing can be installed. They may be attached to masonry by expansion anchors or toggle bolts.

The type and arrangement of grab bars within dwelling unit bathrooms may vary with the type of handicap of the occupant, and should preferably be decided upon in consultation with the physically handicapped occupant of the dwelling unit.

An eye bolt adequately anchored to the ceiling should be provided for the suspension of a chain or stirrup grip for use by persons in wheelchairs in getting into and out of the bathtub.

ubsection 4.8 BEDROOMS

Houses can be made more comfortable for handicapped persons by considering the layout of rooms or even by modifying existing plans. The following Figure suggest a layout for a typical bedroom.



Bedroom layout

INDEX

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Central Mortgage and Housing Corporation
Société centrale d'hypothèques et de loge

Housing the Handicapped

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Housing the Handicapped

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The fate of our handicapped has not been enviable, nor is it now. We must not fool ourselves. For centuries, the disabled have been objects of pity and commiseration. They have also served as a means for the supposedly normal to vent their feelings of guilt.

Fortunately, for some 25 years now, a basic change has been felt. The handicapped have come out of their traditional isolation. They have stepped out into public view with their artificial limbs and in their wheelchairs. More and more attend schools, colleges and universities. The handicapped have become a pressure group that now justifiably wants to make its contribution to the growth of Canada.

Too often after being prepared at great cost to fill a role in society, the physically and psychologically rehabilitated handicapped is prevented from filling that role. So-called architectural barriers often frustrate the best-laid plans for the future. A couple of steps, too narrow an exit, a small room and the individual becomes a prisoner of his environment.

This Central Mortgage and Housing Corporation publication, for which I have the honour to write a foreword, is not a first effort to smooth out and minimize architectural barriers. In 1946, I witnessed important changes and additions to buildings put up by CMHC for paraplegic veterans.

The plans, specifications and diagrams in this handbook are clear, accurate and above all, simple. The architect, builder and resident will profit from using this manual. It can also serve as a reference manual for rehabilitation teams: doctors, physiotherapists, work therapists and social workers for whom one of the most important roles, if not the most important, is to reintegrate the handicapped into the family environment.

We must hope that in the near future the federal, provincial and municipal governments will see to it that architectural barriers are a thing of the past in a country that considers itself just and democratic.

G. Gingras
Past President
Canadian Medical Association

Administrator
Rehabilitation Institute of Montreal

The terms *disability* and *handicap* cover a wide range of physical and mental illnesses or defects. Here we are concerned with only a part of the spectrum of physical disabilities.

Strictly speaking, a person who depends upon eyeglasses or a hearing aid is disabled; but these aids do not severely limit the activities of the user. A handicap as defined in this publication is a physical disability so severe that the individual cannot carry out a full range of normal everyday activities, even with the aid of prosthetic devices.

It must be recognized that handicapped people have the same need as others for friendship, a satisfying job, an adequate income, recreation, a choice of comfortable housing, and personal independence. Their efforts to meet these needs, however, often are frustrated by the physical obstacles they encounter in trying to use the environment in which they live.

For example, the ambulatory handicapped person with a moderate disability, such as loss of coordination, arthritis, or an amputated arm, finds it difficult to use door knobs, stairs and other common design features that make it possible for able-bodied people to move around in the community.

Many seriously disabled persons, particularly those confined to wheelchairs, cannot use public transport and have difficulty finding suitable accommodation and satisfactory employment. These individuals usually must resign themselves to a low income and a way of life that offers an extremely limited range of activities.

These problems may be remedied to some extent by social assistance, health assistance and rehabilitation programs. A preferable course of action, however, is to prevent such difficulties by improving living conditions for the handicapped and by providing full access to work and recreation facilities in the community.

The three areas that require modification are the design of

1. public transportation vehicles and facilities
2. public buildings, including places of education, employment, commerce and recreation
3. public and private housing.

In Canada, there are at present no requirements for the provision of access to public transportation for handicapped persons. Regulations for access to public buildings are contained in Supplement No. 5 to the National Building Code, handicapped persons within the community. Here the term *housing* is used in its broadest sense, to mean the provision of a dwelling for the handicapped individual which is designed to accommodate the disability and is located close to required community facilities and services. It is our concern to set out clearly the features of housing design that will serve these two requirements.

The housing design recommendations in this document are based upon the following goals:

1. Ambulatory persons with moderate disabilities should be afforded a wide range of choice in the type and quality of their residential accommodation.
2. The moderately disabled, including those confined to a wheelchair, should be free to choose where to live in the community; they should have broad access to educational and employment opportunities; and their housing should allow a maximum degree of independence from personal assistance in performing everyday activities.
3. At least some of the severely handicapped now confined to institutions should have the opportunity to live in a non-institutional, sheltered residential environment in their home community.

Who are the Handicapped?

Those considered to be handicapped comprise over 10 per cent of the general population.[1] This group is highly diverse in terms of age, family situation, income and type of disability.

The incidence of physical handicaps is higher for the elderly than for any other age group. This reflects the fact that the normal aging process is accompanied by a general deterioration of the body. The consequences of disabilities are different for the elderly than for the young: often it is more difficult for the older person to adapt physically and emotionally to his disability; a young person may in fact train himself to overcome his handicap.

The needs of the handicapped individual vary according to his position in the family. A disabled child may be raised by his family; but if he is severely handicapped or if either of his parents also is handicapped, it may be more appropriate for him to receive special care in a sheltered residential setting. The disabled youth may prefer to live in a place of his own as he approaches adulthood; but again, if his disability is severe, he may want and need the mutual support found in living with a small group of disabled persons.

[1] It should be noted that this figure is not based on first-hand Canadian studies, and that a wide range of disabilities is included.

In a family where the wife or the husband is disabled, many needs can be supplied by the nonhandicapped marriage partner. In other cases, where both man and wife are handicapped, it may be preferable for the couple to live among their peers. It should be recognized that marriage between disabled persons is occurring with increasing frequency. This is a healthy indication that the needs of these individuals for a full social and sexual life are being recognized by handicapped persons and by the society in which they live.

A disabled elderly person may live alone, with a marriage partner, or with others who are old and or handicapped. In rare instances, he may live with his grown children. Often, the demands of the elderly for special assistance are greater than those of younger handicapped persons, because their disabilities are accompanied by a failing in physical strength and a dulling of the senses. Many of them therefore may benefit from a sheltered residential arrangements within the community.

Most disabled people earn a very low income. Sheltered workshops are a help, but the concept is limited in the scope of work available and the income earned. Many handicapped persons could take advantage of employment opportunities in most fields if physical barriers in the work environment were removed. Few office buildings, for example, provide washrooms, ramps, doorways and corridors designed for use by persons confined to a wheelchair.

The personal and emotional vulnerability of a disabled person requires that any public intervention or assistance must be very carefully thought out. Respect for the individual should be a primary concern, and this means that no stereotyped solutions should be considered.

The assumption which underlies most of the ideas in the document is that many disabled people now reject the isolated way of life which was common in the past. The old public attitudes of fear and repugnance to severe physical disability are now changing, and this will in turn encourage greater participation in activities and a greater need for social contact.

Disability Types

Various types of disabilities require various adaptations o the environment. The following list indicates some partic housing needs.

Class	Personal Implications	Environment Implications
Bedridden	Constant care required	Institutionalization cessary, or special facilities when care for at home
Wheelchair	Some personal care and assistance, particularly out of the wheelchair	May live in own ho or apartment, if ren vated or specially d signed, or may live residential group h
	May be capable of complete independence, if barriers removed	May live in normal housing context, w design modificatio and full range of se ices available
Semi-ambulant	In some cases, some personal care needed	Independent living where personal car available or resider tial group home
	Complete independence possible	Normal range of ho ing options, with so special design fea tures
Ambulant	Usually complete independence	Normal range of ho ing options where f services and some personal care avail able; perhaps resid tial group home as half-way house be tween hospital to h
	Very few personal limitations	Normal range of ho ing options; specia design features de sirable

Housing Alternatives

In view of the diversity of needs, disabilities and desire handicapped persons, the fundamental housing requirem is for a great variety of accommodation, in terms of locati type, size and degree of specialized design. All such hou ing should be well located with respect to a full range of standard and special community services. Finally, since many disabled people earn a low income, there should be available both unsubsidized and subsidized housing suit to their needs.

The great variety of disability types and individual desires call for a series of at least three housing types.

Minimum Criteria

The first housing type, described in section 1, attempts to satisfy the need for a large quantity of units, in a variety of locations. This goal implies that the dwelling units would have to be equally suitable for handicapped and non-handicapped tenants. To provide this flexibility, units are needed which are accessible to handicapped persons, but which are not appreciably more costly than conventional units. Analysis of typical modern apartment buildings has shown that only minor modifications would be necessary to provide this minimum level of accessibility. Use of the criteria would therefore cause only a slight increase in building cost, a fact which may lead to their acceptance by private developers In this regard, it should be recognized that a building accessible to handicapped people is also more easily accessible to children, mothers pushing baby carriages and elderly persons.

Residential Group Homes

The second housing type proposed is the residential group home. This is a residential unit suitable for a group of handicapped persons who want or need the mutual support of a small, close-knit group. Depending upon the disabilities, ages and desires of the residents, a residential group home may function as a short-term half-way house or as a permanent residence. A group home should convey a domestic character, and for this reason a maximum group size of ten handicapped residents plus a resident director and required staff is suggested. As the residential group home is intended for a specific group of handicapped people, the building must permit a maximum degree of comfort in living conditions. The appropriate design criteria are found in sections 2, 3 and 4.

Integrated Housing

An alternative form of housing is needed for those handicapped persons who require some services and specially designed units, but who wish to live independently among people who are not handicapped.[2] The most suitable arrangement for this need is to designate a certain number of dwelling units within an apartment building for use by handicapped persons.

The building and the designated units should be designed according to the criteria in sections 2 and 3. The number and location of the special units is an important factor in the success of the concept. There must be enough units to justify the provision of special services, but not so many that social interaction with the other building tenants is reduced. About 10–20 units or 10 percent of the total number of units in the building is therefore recommended. These units should be dispersed throughout the building to encourage informal contact with other building tenants or owners. An area should be provided in a central location within the building for ancillary offices and possibly some therapeutic facilities. Any social and recreation facilities should be shared with other residents. This category of housing includes units for disabled elderly people in senior citizen housing, but this is a special case because of the particular life style and social needs involved.[3]

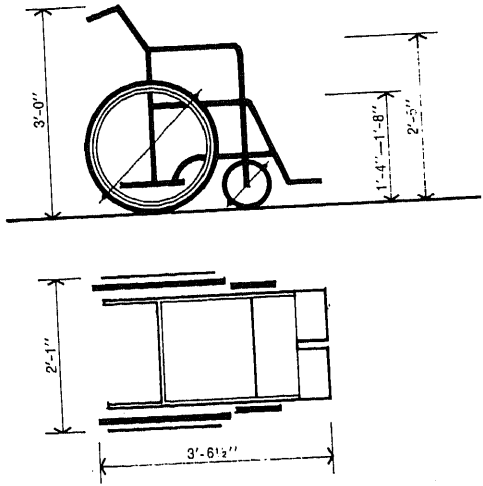
Finally, those disabled people who have the means and desire to modify a family house for their own use, will find advisory criteria in Section 4, although much of Section 3 is also applicable.

[3]See Central Mortgage and Housing Corporation, *Housing the Elderly* (Ottawa: CMHC, 1972).

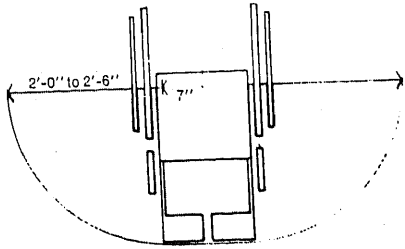
Design Principles

rdless of the type of disability, certain principles should opted in designing accommodation for handicapped ns.

Typical Wheelchair Dimensions

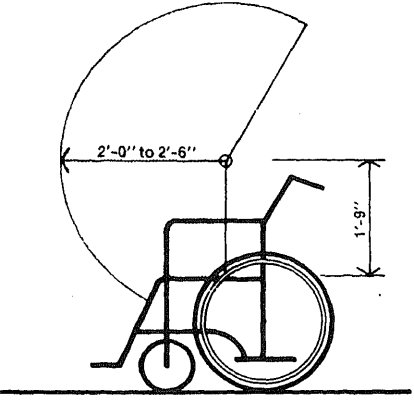


Approximate adult horizontal reach from a wheelchair



Criteria to cover most physical disabilities.

ate adult vertical reach from a wheelchair



1. Everything should be operable with one hand. The second hand may be needed to maintain balance, or it may not be functional.
2. All rooms in the building or dwelling should be readily accessible. Ramps should be provided instead of steps and staircases. There should be no door sills and entrances should be wide enough to permit passage of a wheelchair.
3. Space should be allowed inside the dwelling to permit lateral transfer of the disabled person from the wheelchair to the toilet, bathtub, bed and other furniture.
4. The need to bend down and reach up should be reduced. Loss of balance is a common hazard among the disabled and constant physical stability is necessary for many. A person's vertical reach from a wheelchair is limited and frequent stooping and stretching may be physically exhausting.
5. Cupboard doors and drawers should be designed to permit access to storage by the wheelchair user.
6. Storage should be provided to accommodate a wheelchair when it is not in use.
7. All potential sources of injury should be eliminated. There should be no sharp corners, slippery floors, unprotected hot surfaces or tightly sprung door closers.
8. The dwelling should require minimum maintenance. Many disabled persons are unable to perform all the necessary household tasks and they may be financially unable to purchase housekeeping assistance.
9. Communication with the outside world should be direct and unobstructed. Access routes to the street, to the parking lot and to other homes should be free of stairs, steps and similar barriers.

At relatively low cost, apartment building design can be modified to permit basic access and use by handicapped persons. The inclusion of such modifications should be considered for all new multiple-unit buildings. Use of the criteria outlined in this section will allow persons confined to wheelchairs to enter and move around the building without encountering physical obstacles, and to live in the apartment unit in reasonable comfort.

The principles are most easily applied to elevator apartment buildings of all types, but even walk-up buildings can be designed so that the ground floor is accessible.

[4]Recommendations in this section are based upon those given in the National Research Council's "Building Standards for the Handicapped", Supplement No. 5 to *The National Building Code of Canada*, 1970, NRC Publication No. 11430 (Ottawa: National Research Council 1970).

Access to the Building

For exterior access, a passenger drop-off area should be provided, with a direct and level route to the entrance and elevator lobby. Some parking spaces should be reserved for use by handicapped persons, with direct and unobstructed access to the building.

Where a change in level is necessary between the exterior and the elevator lobby, a ramp should be provided, in addition to stairs, according to the design criteria outlined on page 23.

The main entrance should be designed for use by handicapped persons. Entrance doors should be a minimum width of 3'-0". Automatic sliding doors with speed control are ideal, but normal swing doors that are easy to open and slow to close also are satisfactory. A 1'-0" high kickplate will prevent possible damage to the door by wheelchairs.

A manoeuvering area 2'-6" by 4'-0" should be provided clear of the swing door, with a 2'-0" space on the handle side of an out-swinging door. The depth of the vestibule should be no less than 5'-0".

All residents of the building should have access to its basic facilities. These include the lobby, the main social and recreational facilities, mailboxes, the laundry room, the garbage deposit area and the indoor garage if one is provided.

Access should not be obstructed by intervening stairs or thresholds; and all hinged doors should have a minimum width of 2'-8" and be easy to open and slow to close. There should be a clear 2'-0" wall space on the handle side of all out-swinging doors.

Elevators also must accommodate wheelchair users. Control buttons inside and outside the cab should be arranged horizontally not more than 4'-8" above the floor; and doors that close relatively slowly are desirable.

Washrooms are usually provided adjacent to recreation rooms and lounges. Where provided, these facilities should be designed for handicapped persons, in accordance with the National Building Code, 1970, Supplement No. 5.

d Use of the Apartment Unit

units should be designed to enable a handi-
on to gain access to the unit itself and to all the
ains.

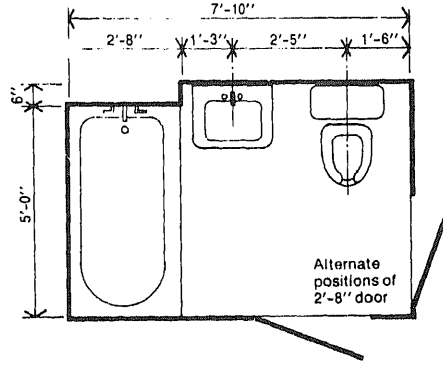
uld have a minimum width of 3'-2". Doors pro-
s from the corridor should have a minimum width
other doors in the unit should be at least 2'-8"
g a clear passage of 2'-6". A clear wall space
ld be provided on the handle side of an out-
r.

nies are provided, thresholds should be reduced
n of ¾", with one side bevelled.

ease in normal dimensions will make the bath-
by the wheelchair occupant. A cantilevered
recommended to allow wheelchair access. An
2'-8' door is necessary for entry. The accom-
ch shows two alternative door positions. The
ation is on the long wall, as this allows the ten-
a grab-bar on the wall beside the toilet.

g hardware usually provided for doors, windows
n equipment may be difficult or impossible for a
d person to operate. Lever door handles should
d for all hinged doors; window hardware should
y to manipulate and mounted no higher than
e floor; kitchen and bathroom faucets should be
h lever handles; and the handles of built-in
nd drawers in the kitchen and elsewhere in the
e easy to grasp.

Bathroom layout



These criteria provide a high degree of access and convenience.

"Penny wise, pound foolish."

section describes design principles and details suitable uildings in which handicapped persons are expected to vith a maximum degree of comfort and convenience. category could include an apartment building in which tered units and all building facilities are designed for purpose. An alternative is a small group residence de- ed or renovated to house disabled people exclusively. th cases, the provisions of this section should be con- ed as a shopping list of ideas, from which are selected e relevant to the actual situation.

ause of the greater emphasis on comfort and long-term ility, the requirements of this section are more extensive those of section 1. Easy access to all building and lling unit facilities is needed for the wheelchair user and quipment must be simple to operate. These provisions esult in costs somewhat higher than in normal residen- construction.

Planning, Vehicular Access, and Parking

choice of a site for the construction of a new building or enovation of an old one is a crucial factor in the housing ndicapped persons. There should be ready access to pping and cultural facilities and community services. The in the immediate neighbourhood should be relatively ecause hills may limit the mobility of those who are pled or are confined to a wheelchair.

need and capacity for public activity depends upon ature of the handicap. Many quadriplegic persons, for mple, may not wish to be pushed around stores and other c places in a wheelchair. It is important, however, to de them with an open choice in the matter; and, of se, persons who are not so severely handicapped will ome the opportunity to move easily about the com- ty.

Because public transportation generally is not designed for use by the handicapped, these individuals rely heavily on automobiles for travelling to and from their home. Ample parking space therefore should be provided, as well as convenient access to the building at drop-off points and from the parking area itself.

Approaches to the building should be designed to make it possible for a handicapped passenger to be dropped off directly in front of a main entrance. A roof shelter should be provided and the walk to the door should be short and direct.

The handicapped person who drives can, of course, park the car himself. Outdoor parking is not ideal, but economically it may be unavoidable. In parts of the country that experience severe winter conditions, a sheltered parking area should be considered a necessity for handicapped people. In the case of a very small project, or the renovation of an old building, this may be prohibitively expensive; but indoor parking should be included in medium to large size elevator apartment buildings.

An elevator entrance should be provided at each level of the parking garage. If there is a change of level between the parked car and the elevator, the access route should be ramped (see pages 25 and 26).

Parking spaces to be used by handicapped persons should be 12'-0" wide and identified by a sign or symbol. Spaces to be used by handicapped persons should be located as close as possible to an entrance. The driver or passenger should be able to enter the car without being endangered by other parked cars which may back out without warning. Also, it should be possible to operate garage doors without leaving the driver's seat.

Gardens and Terraces

Many disabled persons, particularly those who are elderly, spend most of their time in and around their dwelling unit. A garden or other outdoor recreation area is desirable, to provide an opportunity for visual stimulation, fresh air, exercise and the pursuit of a satisfying hobby. An indoor planting area or greenhouse also may be designed for buildings in the colder parts of the country.

Terrace and garden areas may be designed for exclusive use by the handicapped, but more commonly they will be used by able-bodied persons as well, particularly when they are attached to a mixed-use apartment building.

A garden may contain a variety of flowers, trees and shrubs. These should be planted in attractive arrangements, leaving a generous amount of open space to facilitate movement around the garden and to permit outdoor games. Because the garden may be used by blind persons, prickly and toxic plants should be avoided or planted in areas that are not easily accessible. Where access is desirable, for examining or tending plants, the planting area should be raised to a height of 2'-0" to 3'-0".

The garden area should be as level as possible, without interfering with drainage. If it is terraced, the slope of the pathway should be gentle so that it can be used by persons in wheelchairs and by those with canes or crutches. A handrail should be provided for a slope exceeding 1:20 and the pathway should be ramped. Cross gradients should not exceed ¼" per foot. Steps may be provided with handrails, but only where there is also an alternative ramp route.

Walkways should be at least 5'-0" wide so that a wheelchair can be turned around. Right-angled turns in the path should be avoided.

The surface of the path is important, too. It should be firm and even. Paving block with large joints and gravel or mud paths are not suitable. The edges of pathways should be plainly marked by paving material of a contrasting texture and colour. Curbs and other raised or depressed features are not recommended.

Exterior hose connections and electrical outlets should be placed 2'-0" to 4'-0" above the ground and should be accessible from a paved area. A storage unit for garden tools and other outdoor equipment should be provided.

A generous number of permanent outdoor benches should be provided near pathways, but not infringing on them.

Wind breaks in the form of fencing, trees, shrubs or terraces are necessary in many locations, particularly near high buildings. Other attractive features may be added such as fountains, pools, birdbaths, feeder stations and bird houses.

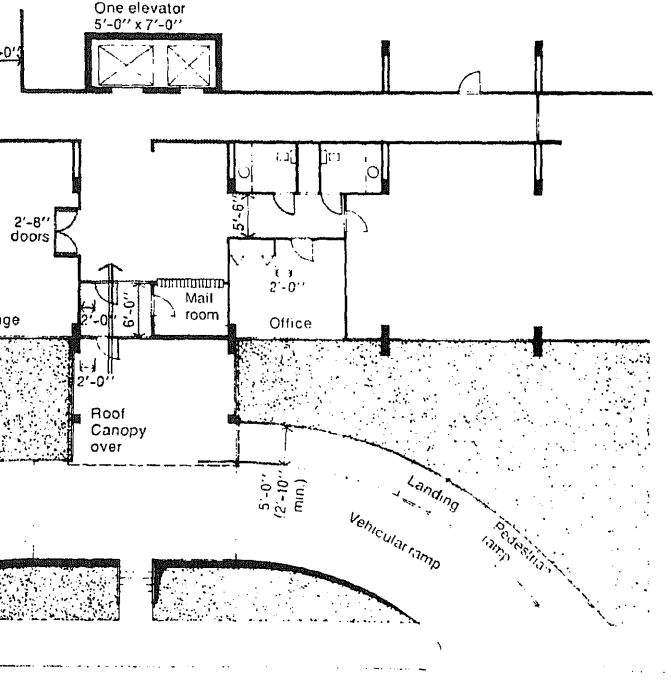
Entrances to the Building

A level paved area at least 5'-0" by 5'-0" and sheltered by a roof or canopy should be provided outside all entry doors and doors allowing access from parking areas. If a change in level is necessary between the doors and pedestrian or vehicular approach points, stairs and ramps should be provided.

Entrance doors to buildings should preferably be of the sliding type. If swing doors are used, 3'-0" single-leaf types are preferred that are easy to open and have a slow-action door closer. The preferred door pull pressure is 5 pounds; 8 pounds is the maximum. Automatic door closers are available and are desirable if the speed of door action can be controlled. Where door handles are required, a large lever type should be utilized. A 1'-0" high kickplate is recommended.

The vestibule inside the entrance door should have a minimum depth of 6'-0".

areas


One elevator
5'-0" x 7'-0"
2'-8"
doors
5'-6"
2'-0"
Mail
room
Office
6'-0"
2'-0"
Roof
Canopy
over
5'-0"
(2'-10" min.)
Landing
Vehicular ramp
Pedestrian
ramp

Circulation in Public Areas

The main consideration in the design of circulation space for handicapped persons is that it should be fully and conveniently usable by those in wheelchairs. There must be a more generous space allowance for manoeuvering than is required in the private dwelling unit. The basic design principles are as follows:

1. Changes in level should be avoided, but where they are necessary, ramps should be provided as well as stairs.
2. Space should be provided in corridors and other areas to permit wheelchairs to make a complete turning circle (5'-0" by 5'-0").
3. There must be adequate clearance for the wheelchair user to open an out-swinging hinged door without being positioned within the arc of the door swing. A minimum space of 2'-0" at the handle side of the out-swinging door and an access area of at least 2'-0" by 5'-0" will satisfy this requirement. This area can sometimes be reduced depending upon the direction of access (see also sketches on page 28).

The design of corridors should attempt to compensate for ambulatory and visual handicaps. Floors should be slip-resistant and lighting levels should be high. Doorways leading into separate living units should be distinguished by colour, number and be brightly illuminated. An institutional effect can be avoided through the sensitive use of colour, texture, lighting and through the provision of windows affording a view of the outdoors.

Perception studies indicate that people react negatively to public corridors that are long, narrow and visually monotonous. Ideally, building corridors should have a minimum width of 5'-0" and a maximum length of about 40'-0". Where the floor plan of the building requires longer corridors, they should be staggered or angled, and materials in a variety of colours and textures should be used. Where doors open out into the corridor, the width should be increased to 5'-6". Windows offer visual variety and also augment interior illumination.

Where handrails are provided, they should be placed along both walls of the corridor so that a handicapped person with a disabled right or left hand can use the support on either side. They should be dimensioned and textured to ensure a firm grip and mounted at a height of 3'-0". Tubular handrails are recommended, and they should be at least 1¾" in diameter with a 1½" clearance from the surface of the wall. When handrails are interrupted by a doorway or opening, they should curve back to the wall at the point of termination or should provide a tactile warning about 6" ahead of

Special features may be incorporated to serve as a guide for blind persons. The blind are sensitive to texture variations in wall and floor surfaces, and to the resonance of particular spaces. Wall, floor and ceiling materials therefore may be varied to indicate the route that the corridor follows. For example, where two corridors meet, the floor covering may be changed from carpet to wood; similarly, the end of a corridor may be indicated by a break or change in surface material. For the partially blind, large, brightly coloured directional signals placed along the wall may serve the same purpose.

Service Facilities

Certain service facilities are normally provided in residential buildings: a mailbox area, an intercom system a garbage chute and a laundry room. In large buildings, public telephones and washrooms may also be provided. Special consideration should be given to the design of these features to permit access and use by handicapped persons.

Mailboxes should be located in the entrance vestibule where they are readily accessible. Boxes for disabled persons should be placed no lower than 2'-0" and no higher than 4'-8" from the floor.

Call buttons from the vestibule to individual living units should be placed no lower than 2'-0" and no higher than 4'-8" from the floor. The intercom should be of the telephone type on a flexible cord, with a telephone cradle fixed about 4'-0" above the floor, both in the vestibule and in the living unit.

For deaf persons, a closed-circuit television system may be provided to permit residents to identify visitors in the lobby. A flashing light in the dwelling unit would indicate the arrival of a visitor.

Garbage chutes should be easily accessible. Where a chute is located in a separate room, a minimum area of 2'-0" by 5'-0" should be provided clear of the swing of the door.

quire generous floor space to allow turning
e wheelchair. Laundry machines with side-
ding doors are desirable for easy access.

s should be located in an open booth with
hood can provide privacy and acoustical
trument should be fixed lower than is usual:
should be higher than 4'-8" and a shelf
ed at a height of 2'-9" to hold telephone
nal belongings and to provide support. A
f 1'-8" is also desirable.

s should have doors at least 2'-8" wide with
ning. Clearance around all equipment
upon the criteria given on pages 38 to 44.
ve a lid or a permanent back rest and a
be provided on one side (see pages 38-39).
let compartments may be converted to this
esigned compartment should include a
asin; urinals should be floor mounted and
r of the washrooms[5].

ing men's and women's washrooms, it is
nay be more economical to provide a single
oom for handicapped persons of both
gical arrangement, particularly when the
s accompanied by a helper of the opposite

esident director, superintendent or care-
dily accessible. The best location probably
n entrance lobby.

upon those given in the National Research Councils',
the Handicapped".

Social and Recreational Facilities

There are two considerations in designing social and recreational facilities intended for convenient use by handicapped persons: access to facilities and the types of facilities provided. Again, convenient wheelchair access to all facilities is necessary.

The types of facilities included will depend upon the size of the building and the proportion of handicapped persons among its occupants. In the case of a small group residence designed exclusively for disabled people, necessary economies will permit the inclusion of only a few facilities, such as a lounge and a small multi-purpose room. Where handicapped persons live in a mixed-use apartment building, a wider range of facilities will be required, and their precise nature will depend upon the various needs of all the residents. Here we will discuss each type of facility in terms of the needs of the disabled, but the needs of other possible users also should be considered.

Lounges, sitting areas, party rooms and similar spaces will be used for a wide range of activities. Since many of these will develop from the needs of the residents, the architect cannot easily predict and plan for the use of these areas. It is therefore wise to design lounges and recreation areas to permit a variety of uses. Generous storage space is an essential part of any lounge or recreation area.

In large apartment buildings, small sitting rooms are useful, in addition to a main lounge. These may not be extensively used, however, unless they are adjacent to an activity area such as a laundry room.

In an apartment building, easy access to a restaurant or cafeteria is desirable. If a self-service cafeteria is contemplated, the design should permit wheelchair access to the food pick-up area.

Where exclusive use by a small group of handicapped users is intended, the space requirements for circulation and dining are increased. The standards outlined on pages 31 and 32 can be used, with a more generous allowance for circulation areas.

Workshops and activity rooms may be used for recreation, but they may be used also for training or as a sheltered workshop producing saleable goods. The designer is advised to determine the extent of proposed activities before allocating space for these operations.

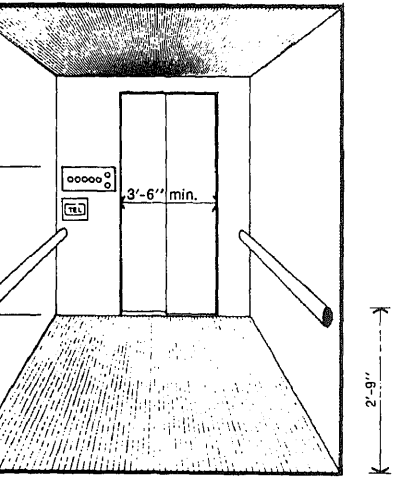
Swimming pools, sauna baths and exercise rooms are valu-

Floors should be slip-resistant and grab-bars should be provided. Special equipment for entering and leaving a pool may be required–for example, a chute, a mechanical lift or steps with handrails. The nature of these items, which may have both recreational and therapeutic uses, must be decided by the designer in conjunction with the client. Where floors are sloped for drainage, the slope should be the minimum required.

Changing rooms should be larger than normal. Bench-seats should be provided at a height of 1'-8" and they should be fixed to a wall. Showers should conform to the requirements set out on page 40.

Any facility that promotes contact with the public will help to prevent the isolation of disabled people. A shop or store on the ground floor of the building, possibly opening onto a street, may provide an outlet for goods produced in the workshop, and it may serve as a cornerstore that is used and/or operated by residents.

A roof garden, sun rooms, or a hot-house would allow those who enjoy the cultivation of plants or flowers to do this through the year in controlled conditions. This can be important in boosting the morale of those who are confined to the building for long periods.



Elevators

Elevators are essential in multi-storey buildings used by the handicapped. They must be designed so that a wheelchair user can operate them conveniently and safely. Safety and reliability are more important than speed. At least one elevator should be provided in buildings of two or more floors that are intended for use by the handicapped.

An aspect of great concern is the safety of disabled persons in case of fire. They are dependent upon the elevator for escape from upper floors, but a typical elevator installation is one of the first items to malfunction or to be shut down in this situation. For this reason, at least one elevator should be designed in accordance with Section 3.2.6.6 of the 1970 National Building Code.

In large buildings, at least one elevator should have an interior cab size of approximately 5'-0" by 7'-0" to accommodate a wheelchair and furniture. There should be access to a secondary building entrance from this elevator. Cabs in other elevators should be a minimum of 4'-0" deep. Handrails should be provided on three sides of the cab at a height of 2'-9". Minimum clear door opening should be 3'-6".

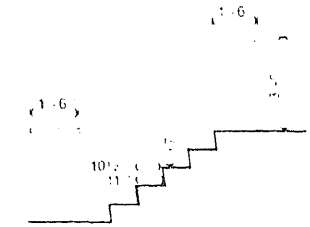
A shelf for packages should be provided in the cab and in each elevator lobby. The shelf should be at least 8" wide by 1'-4" long, mounted at a height of 2'-6". A fold-down type of shelf may be used. As this shelf also may be used as a temporary resting place, the attachment should be designed to support a 250-pound load.

If the building is in an area where elevator repairmen are not quickly available, a manual lowering device should be provided which can be operated safely by building maintenance personnel.

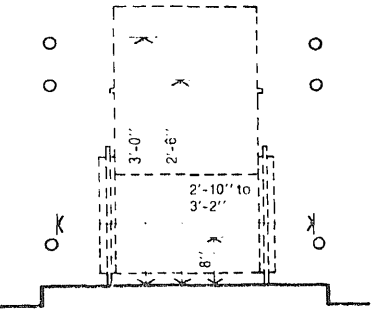
Control buttons inside and outside the cab should be arranged horizontally not more than 4'-8" above the floor. The inside control panel is best located on the side wall of the cab, ideally on both side walls. There should be a voice-intercom system connecting the elevator cab with an alarm bell and receiver located in the manager's office or in the lobby. Lighting levels should be higher than normal.

Elevator doors should remain open for at least five seconds and should close slowly. Elevator equipment should be chosen which permits regulation of the speed of the elevator, of the time the door remains open, and of the door-closing speed as required to suit the needs of the residents. A quick-response photoelectric sensor and rubber bumper guards should be used.

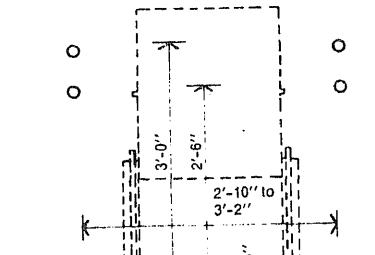
commended stair details



amp section showing lower rail



Ramp section showing curb detail



Public Stairs

Where a change of level is unavoidable, a ramp or stair may be used. Because not all disabled persons prefer or need to use ramps, both stairs and ramps should be provided.

Stairways should consist of a short, straight flight with a minimum of three risers and a maximum of ten risers per flight. Steps should have plain faces with no projecting nosings or open risers.

Tread dimensions should be a minimum of 11" in depth with a minimum run of 10½". Riser dimensions should not exceed 7". The product of rise and run should not be less than 7" more than 75. A minimum stair width of 3'-8" is recommended.

Treads should be non-slippery with either an abrasive surface or inset abrasive strips. A soft plastic nosing of contrasting colour should be used over carpeting. For other stair finishes, treads and risers should contrast in colour to eliminate visual confusion.

Handrails should be provided on both sides of stairs at a height of 3'-0" above the nosing. If the building is to accommodate elderly persons, the height should be reduced to 2'-9". Handrails should extend at least 1'-6" beyond the last step in a flight and should be continuous along landings. Tubular handrails with a diameter of at least 1¼" are recommended to provide a firm grip.

Public Ramps

Ramps are required by all handicapped persons in wheelchairs, and they may be preferred to stairs by those with other limitations. They are essential in all buildings intended for use by the handicapped.

In regions with severe winter weather, exterior ramps should be covered or serviced by a snow-melting system. If these requirements cannot be met, arrangements should be made for thorough and immediate removal of snow and ice.

A curb 6" high or a guardrail mounted at a height of 8" above the ramp deck should be provided to prevent wheelchairs from slipping over the edge.

If a change in level is necessary, a gradient of 1:20 is preferred, but slopes of 1:12 may be used for a maximum length of 30'-0". A steep ramp of 1:7 for a 15'-0" distance may be used indoors but should be avoided if possible.

landings should leave an area of 2'-0" by 5'-0"
wings. Lower ramp landings should be a mini-
in length. Intermediate landings 4'-0" long
aced at 30'-0" intervals along the ramp and at
ctional change.

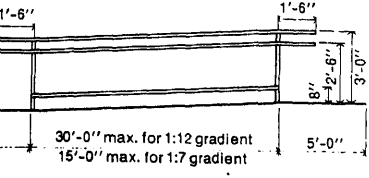
cted width of 2'-10" to 3'-2" between handrails
erson in a wheelchair to use both hands for
his width should be utilized where gradients

d be equipped with handrails, to provide sup-
latory and semi-ambulatory persons and for
sers. Two sets should be provided: one at a
" and one at 2'-6".

uld extend a minimum of 1'-6" beyond the end
Tubular handrails are recommended and should
meter to ensure a firm grip.

d have non-slippery surfaces. The points at the
m of the ramp where it meets a level surface
oothly graded and unbroken in structure and
ing.

ramp details



Heating, Cooling and Ventilation

Disabled persons make special demands on their physical environment. Some tend to be sedentary and many spend a considerable amount of time in their living unit. Those who are semi-ambulatory or confined to a wheelchair expend a great deal of energy in performing everyday tasks and are likely to perspire heavily and frequently; they may therefore experience some discomfort if the air around them does not circulate freely. Elderly handicapped persons, in particular, are susceptible to respiratory ailments.

Consequently, handicapped persons require a high degree of personal control over conditions of temperature, ventilation and humidity. The heating system should be capable of operating at normal temperature of 75 degrees F, rather than the usual 72 degrees F.

In regions where the summers are hot, an air cooling system should be provided, particularly for small apartment units with no cross-ventilation. In regions where winters are dry, a level of at least 25 per cent relative humidity should be maintained.

There should be no drafts in a building that houses handicapped persons. Extra care should be taken in caulking and sealing windows and doors. Sliding doors are not acceptable as the only source of fresh air to a room, because they cause drafts when open.

Because many disabled persons lose the sensitivity of their skin to direct heat, radiators and all heating pipes should be enclosed. In bathrooms, a ceiling-mounted supplementary source of radiant heat should be provided (see page 45). Where forced-air system are used, they should be provided with efficient and well-maintained filters and with low-velocity diffusers.

Fire Safety

Fire safety is of special concern with regard to handicapped persons, because they are unable to move quickly, freely and they may be unable to use normal escape routes. These problems are compounded in high-rise apartment buildings, where even physically agile persons may be trapped as a result of malfunctioning of the elevator system or the infiltration of smoke into emergency stairwells.

Part 3 of the National Building Code of Canada, 1970, contains requirements for high buildings in recognition of the special problems of fire safety encountered in such buildings. In addition, recommended provisions to control smoke movement have been issued in pamphlet form by the Association Committee on the National Building Code[6].

[6]These documents may be obtained from the Secretary Associate Committee on the National Building Code, National Research Council, Ottawa, Canada, K1A 0R6

Although the special measures described in these documents will improve fire safety, the special case of housing for the disabled in multi-storey buildings should be fully discussed with the local authorities. The safest location for individual dwelling units for the disabled is undoubtedly on the ground floor, but this may conflict with the personal desires of handicapped residents. In any case, efforts should be made to locate these units on the lower floors of high-rise buildings and the local fire department should be informed of the location of apartments occupied by disabled residents. The effectiveness of fire safety installations within the building will be undermined if fire trucks cannot reach all sides of the building having windows, balconies and evacuation points. Clear and unobstructed fire access routes are vitally important, and early consultation with local fire-fighting authorities is essential.

Where disabled persons are housed on floors above the first storey, the following measures are recommended:

1. Under the National Building Code, section 3.2.6., a voice-communications system is recommended in residential buildings more than 12 floors in height. Where many disabled persons are expected to be housed, this recommendation should be extended to include residential buildings having more than one floor above ground level.
2. Balconies should be used as a supplementary refuge area and as an escape point where fire-truck ladders can be provided. Equipment limitations restrict the usefulness of this measure to a maximum of about nine floors. Balconies may be individual or may serve a group of units (see page 45).
3. Smoke and heat detectors should be installed to comply with local fire regulations and by-laws. Smoke detectors should be provided in each unit, connected to a central alarm terminal.

Alarm Systems

High rates of sickness and accident among the disabled indicate the need for an alarm system, particularly where handicapped persons live on their own. The handicapped individual may easily fall, hurt himself, or become ill and virtually helpless without anyone becoming aware of this fact. An alarm system connecting each dwelling unit to a central control point is therefore recommended in new construction.

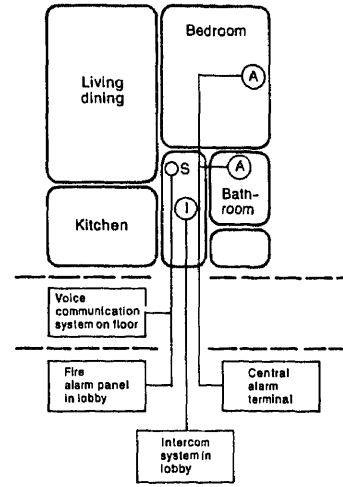
In this case, location of the dwelling terminal is determined by the audible range of the whistle. For deaf persons, a flashing light may operate when the fire alarm system is triggered. For further and more immediate night-time warning, a vibrator may be connected to the bed.

The location of the central terminal varies according to local conditions. Location in a superintendent's apartment permits a response at any time of the day or night.

Another possible location is the lobby or vestibule, where the system can be combined with the intercom system or perhaps with the fire voice-communication system terminals.

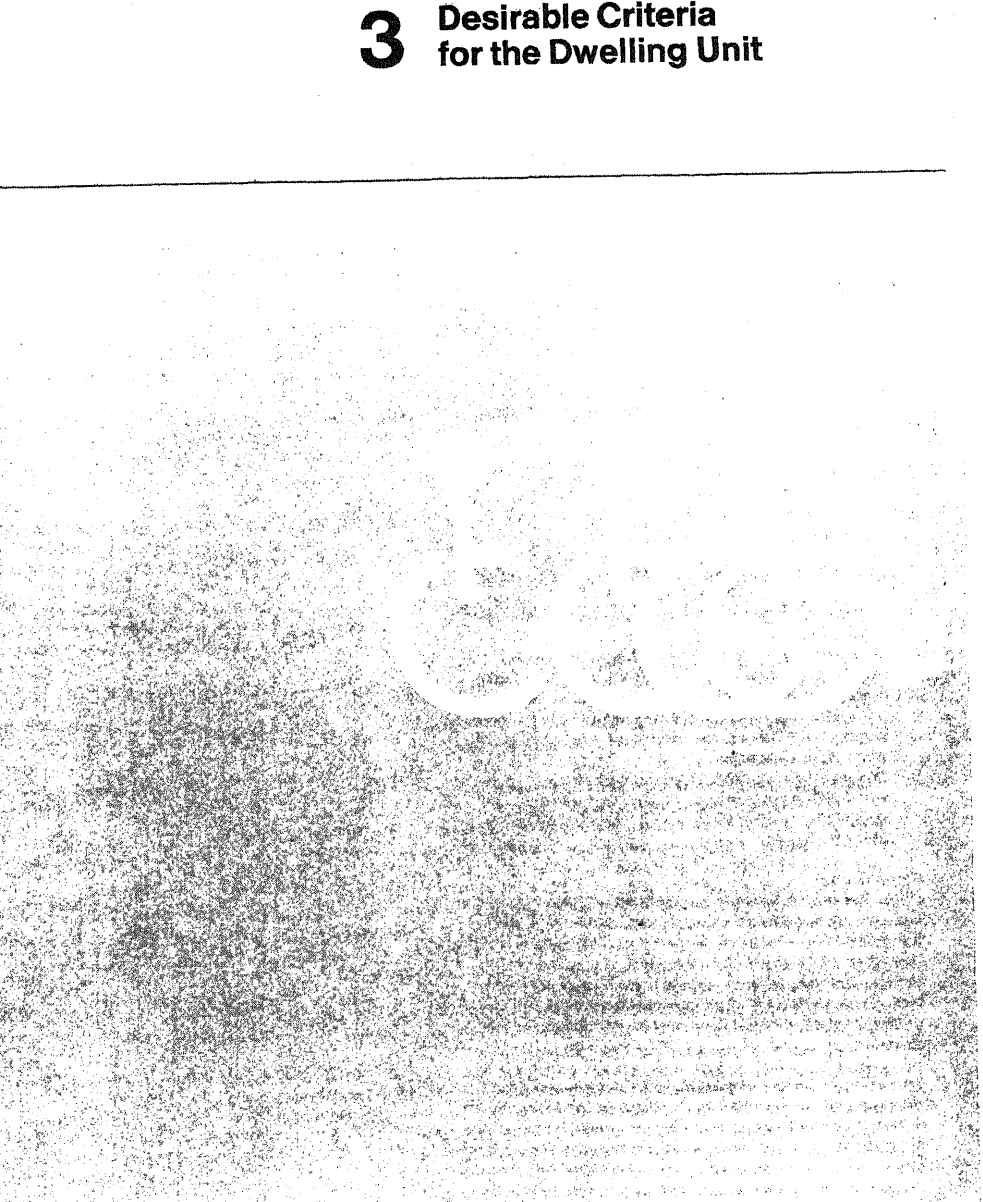
A third alternative is to employ a telephone switchboard using a telephone type of alarm system, but this solution is practicable only when staff are provided around the clock.

Alarm Systems



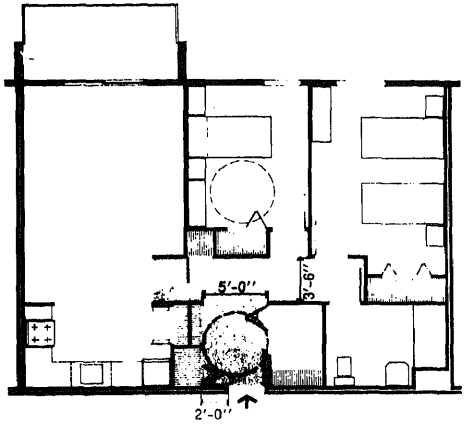
S – Smoke detector

3 Desirable Criteria for the Dwelling Unit



In a residential group home, or in an apartment building where a proportion of the units are designated for occupancy by handicapped persons, the individual dwelling units should be designed for easy access and comfortable use by persons with a wide range of physical disabilities. Here again, the need to accommodate a wheelchair imposes the most stringent requirements on the design and use of space. Most of the advisory design criteria in this section can also be applied to the renovation of single-family houses.

Circulation inside the dwelling



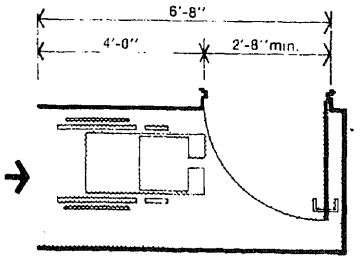
Circulation and Doors

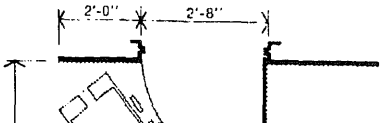
An entry hall measuring at least 5'-0" by 5'-0" clear of door swings, should be provided just inside the door leading from the corridor to the apartment unit, to permit a complete turn in a wheelchair and to allow sufficient space for the removal of outdoor clothing.

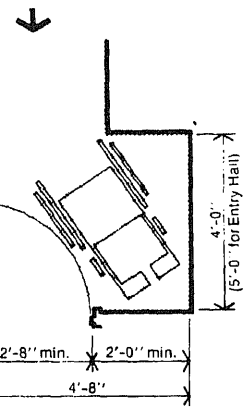
Corridors in the dwelling unit should be at least 3'-2" wide. A width of 3'-6" is preferred, to allow space for the installation of a handrail or to accommodate an out-swinging door. This should be increased to 4'-0" where an out-swinging door may be approached from the hinged side.

Doors within the apartment unit may be of several types. The common hinged door is economical, but hard to manipulate and wasteful of space. Bifold and accordion doors are easier to use, but are not appropriate for entrance and bathroom doors. Sliding doors are easy to operate and occupy little space. Whatever type of door is chosen, it must satisfy certain requirements to be useful in a unit for the handicapped person:

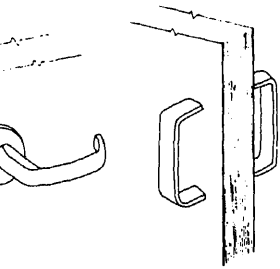
Space requirements for approach to out-swinging doors.



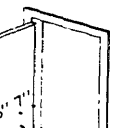




ype door handles.



door showing kick-plate,
switch, and fixed pull handle.



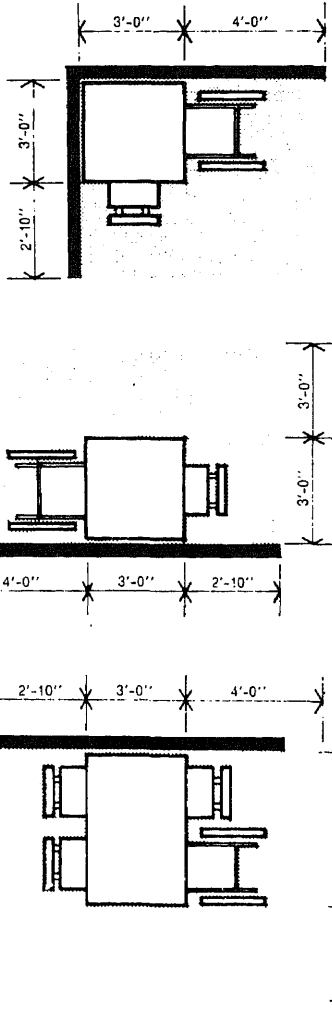
1. It must be wide enough to permit clear passage of a wheelchair. The minimum clearance of 2'-6" requires a 2'-8" hinged door. Where a generous corridor width in the unit is not possible, the door size should be increased to compensate for the difficulty in turning. For entry doors a width of 2'-10" is recommended.
2. The wheelchair user must have enough space to manoeuver into position to open the door. The area required depends upon the direction of approach and the type of door, but it is critical when approaching a hinged door which swings towards the user. An area 2'-0" by 4'-0" clear of door swings is the minimum required in this case. For bifold doors, this area can be reduced to 1'-6" and in the case of sliding doors or in-swinging hinged doors, no additional clearance is required.
3. Thresholds should be eliminated where possible; and where required, a low profile with bevelled edges should be used.
4. Door handles must be easy to grasp. Large lever handles are the preferred type, and handles should be angled or cornered so that they do not catch on clothing. The recommended height is 2'-6" to 3'-0" above the floor. To make it possible for a person in a wheelchair to close an out-swinging door from the inside, a fixed handle should be provided about 7" from the hinged side or a horizontal grab-bar set at a height of 2'-6" to 3'-0". Heavy-duty grab-bars are not required here. Door-closing equipment of this type should be installed on bedroom and bathroom doors, and elsewhere in the unit as appropriate to the preferences of the individual tenant.
5. A hinged door that is left open may obstruct the use of a room. Therefore, if a hinged door is used for the bathroom, it should swing outward to permit maximum use of the space in the room.
6. Door numbers at unit entrances should be placed at a height of 4'-0" to 4'-6" above the floor. Raised screw-on numerals should be used, rather than painted numbers, so that persons with failing eyesight can identify them by touch.
7. It is recommended that an emergency data card be provided on the inside of the entrance door to the unit. This should list the telephone numbers of doctors, the fire department, the building superintendent and helpers of the disabled. A listing of this type is useful for the resident and also for anyone called in to help in an emergency.

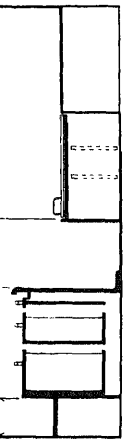
Living and Dining Areas

Living rooms require little basic modification, but the size should be increased beyond the minimum to allow manoeuvering and "parking" space for a wheelchair. Recommended design features for windows are described on pages 46.

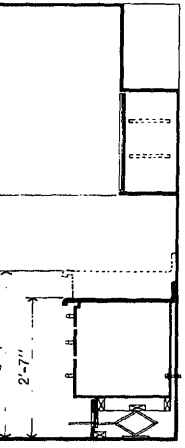
The floor space in the dining area also should be increased to permit wheelchair use. Clearance of 3'-0" between walls and furniture should be allowed for circulation, and an area 2'-6" by 4'-0" provided for the space occupied by a wheelchair at the table. If a separate dining area is provided, it should be directly accessible from the kitchen. A hatch is desirable between the two rooms, linking the kitchen counter directly to the dining table; or a trolley may be used for serving meals.

Area required for various dining arrangements





"B"



Car jack

cal disabilities presents complex problems for the designer. A kitchen ideally suited to a wheelchair user may not be ideal for someone with a different disability, and it may be very inconvenient for an able-bodied relative or friend of the handicapped person. Some of the requirements of these individuals are in direct conflict, particularly in terms of the height of working surfaces and equipment.

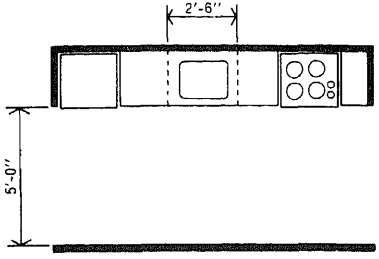
Two alternative approaches to kitchen design may be considered. First, a series of compromise heights may be developed that will not be ideal for any particular user but will be usable by all. This approach (kitchen *A*) allows for standard methods of construction, with little or no increase in cost. Second, a system may be designed that allows limited flexibility in the height of the most important component, the counter (kitchen *B*). A third alternative is a completely flexible, mass-produced system, such as the Fokus kitchen developed in Sweden[7]. This system can be adapted to all needs but it is the most expensive solution and will not be considered in detail here.

In kitchen type *A*, a fixed counter height of 2'-9" is recommended. This is particularly useful where the kitchen is used by both handicapped and able-bodied persons. Standard equipment may be used for all items except the range, which must be lowered by 3" so that it is level with the surrounding work surface. A built-in range which lacks a bottom storage section, is most easily modified for this purpose. Another alternative is to build in counter-top burners and a separate oven, but this is expensive and also requires the provision of additional counter space.

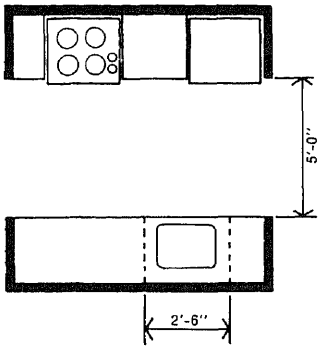
Kitchen *B* is based upon the principle of limited flexibility of counter heights. The idea is being developed at Central Mortgage and Housing Corporation, and a test kitchen has been constructed at the Royal Ottawa Hospital in Ottawa, Ontario[8]. The system can be adjusted to suit persons with various disabilities or can be left at a standard height. The intent is not to adjust the height daily, but rather to set a suitable height for a particular occupant.

[7]See Appendix I for a brief description of the Fokus Society.
[8]An evaluation of this project will be published by CMHC upon its completion.

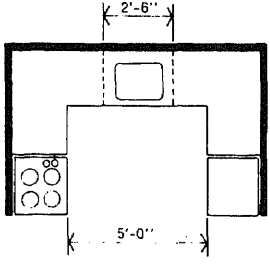
In-line kitchen



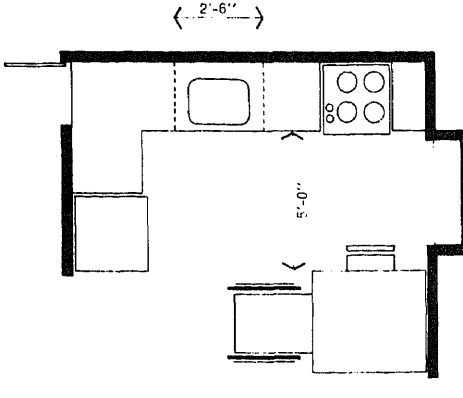
Galley kitchen



U-kitchen



L-kitchen



In the test kitchen, the counter is moved up and down from a height of 2'-7" to 3'-1" by means of standard car jacks that are stabilized by a sliding track at the rear of the base cabinets.

The range is similar to the one used in kitchen *A* except that the base is completely removed and the unit mounted on jacks.

In the test kitchen, no counter cupboards are provided under the sink counter, necessitating a special detail for vertical movement. Base cupboards can be used with the normal jack detail, provided a minimum of 2'-6" knee space is left under the sink.

Plumbing is of special concern in a movable system. Flexible connections must be made for hot water, cold water and waste, assuming that this is permissible under local building bylaws.

Kitchen Layout Types

The layout of the kitchen is often dictated by the overall planning of the residential unit, but it is useful to understand the basic advantages and disadvantages of the various alternatives. For all plans, a 5'-0' clear space is required between solid counters or immovable pieces of equipment.

The in-line kitchen does not provide a very convenient grouping of facilities and equipment, but access is possible to all storage space and equipment.

The open-ended corridor or galley kitchen provides ready access to all equipment but separates the main work surface and the sink from the cooking and storage units. This means that food and utensils have to be carried from one counter to the other, an arrangement that increases the risk of spills and other mishaps. It is difficult to include a pantry cupboard in this layout.

The U-shaped kitchen concentrates the work areas and equipment, making it easy to move utensils from one surface to another. The disadvantages of the arrangement are that lower counter storage space at the two internal corners is difficult to use; and a pantry cupboard can be included only if one leg of the U is extended.

The L-shaped kitchen provides convenient access, concentrates work functions and has only one internal corner. It satisfies the needs of most people and fits into most plan types. A pantry cupboard can easily be included. If the internal corner under the kitchen counter can be opened into an adjoining room, this space becomes a readily accessible storage cupboard.

Whether or not the living unit contains a separate dining area, the kitchen should be large enough to include some dining space. A breakfast table or an extension of the counter may serve this function.

Counters and Base Cupboards

Kitchen counters should be continuous, at a uniform height and level with counter-top burners or the top of the range. The counter surface adjacent to the range or burners should have a heat-resistant covering, such as ceramic tile. There should be a splash-back at the rear of the counter and the front edge should have a raised lip to contain spillage. A finger-hold provided under the lip is useful to the wheelchair user to pull himself close to the counter. Alternatively, a sturdy towel bar may be fixed to the cabinet face just below the counter.

Knee space under the counter is desirable, especially at the sink, to allow a wheelchair occupant full use of the counter area. The space should be at least 2'-2" high and 2'-6" wide. A width of 3'-0" is preferred.

Below-counter storage units should be provided in the form of drawers on roller guides. The fixed shelves that are normally provided are almost totally inaccessible from a wheelchair. A recessed toe space 8½" high and 6" deep is required for all base cabinets to accommodate a wheelchair.

Below-counter storage units on casters are very useful in lieu of drawers. These may be moved out for easy access or can be pulled out completely to provide knee space under the counter.

Extra storage space may be needed for a wheeled trolley used to carry dishes between the dining area and the kitchen

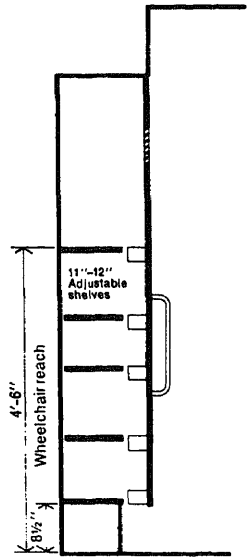
In corner cupboards, a revolving shelf may be installed, or access to the space may be provided from an adjoining room.

Pull-out chopping boards or lapboards are very useful and several should be provided, preferably at a height of 2'-6". Where two or more lapboards are provided, one should contain a hole about 8" in diameter to hold a mixing bowl.

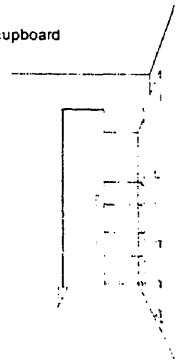
Pantry Cupboards

Overhead cupboards are of limited value to a wheelchair user. For this reason, a full height pantry with fully adjustable shelving is recommended. Narrow shelves should be installed on the inside face of the doors for ready access.

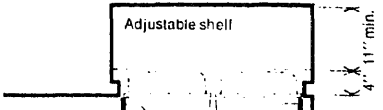
Section through pantry cupboard



Pantry cupboard



Pantry cupboard layout.



Cupboards

lness of overhead cupboards depends upon the
f the resident. If the unit is shared by able-bodied
elatives, or if the disabled resident is ambulatory,
ery useful. The maximum angled reach from a
r is about 4'-6"–roughly to the height of the lowest
ast one cupboard should therefore be included
he shelf at a height of 4'-2" to 4'-6". Cupboards
t be placed over a refrigerator or a sink, and should
laced over a range. Narrow shelves mounted on
f cupboard doors are very useful.

should be stainless steel, preferably with a double
ould be about 5" to 6" deep (shallower than a
unit) so that a seated person can use it in comfort.
of sink can be made to order for a small increase in

ce should be provided under the sink to a minimum
2'-2" and a minimum width of 2'-6". This can be
isting kitchens by replacing cupboard doors with a
d by cutting the floor of the cupboard back at
thin 6" of the back wall. To avoid obstruction by
pipe, the trap should be located close to the rear
bottom of the sink should be insulated to prevent
nees and legs. As a safety device for persons
n is insensitive to heat, a central or individual
tic control may be installed limiting hot water tem-
o about 115° Fahrenheit. Lever faucet handles
used; a single lever operating a mixing valve is
ly desirable.

is a potential source of danger, but most hazards
minated by careful consideration of the limitations
r.

ned earlier, the cooking top should be at the same
e counter to prevent upsets of hot pans. Burner
controls should be at the front or the side of the
hat the user does not have to reach over hot
operate them. Gas stoves are not recommended
elderly persons because the sense of smell often
s with age. A side-hung oven door will reduce the
of burns, but this type is not easily obtained.

dditional features can increase the safety of the
ntrols should include light indicators and large,
ed knobs. The knobs should have raised markings
o those whose vision is impaired. In a family unit,
uld be a master switch for the stove at a height of
" to reduce the danger of children playing with
nted stove controls. An adjustable mirror may be
e wall above the stove, to allow the wheelchair

Other Appliances and Equipment

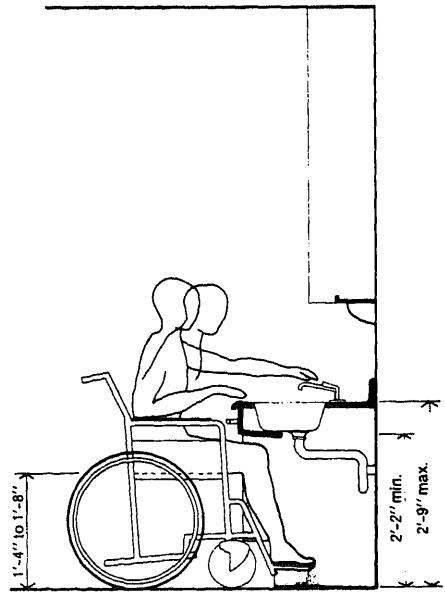
Any standard model refrigerator with a top or side-hung freezer compartment door is acceptable. The type with a side-by-side freezer–refrigerator arrangement is the most accessible. Automatic defrosting reduces the dependence of the user on outside help.

A garbage disposal unit and a dishwasher are two items which are costly, but which are highly convenient for the disabled. In both cases, controls should be mounted close to the front of the counter and the dishwasher should be a front-loading type, preferably with a side-hinged door.

All cupboard, drawer and door hardware should be larger than usual and of the lever or bar type. The space between the handle and the drawer or door face should be 1½" and the minimum length should be 4".

Wall or cabinet-mounted strip lighting throws direct light on the working surfaces and is recommended. This type of light is particularly important over the sink area.

Section through kitchen sink

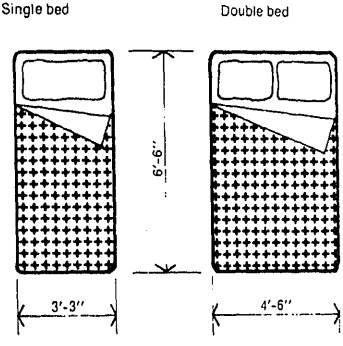


oom units, the bedroom should be generous in
g for the use and storage of a wheelchair. In a
om unit, where the handicapped person may be
ilt or a child, the secondary bedroom should be
cess to a bathroom should be direct and con-
ere space and money permit, direct access to a
ially designed bathroom is desirable.

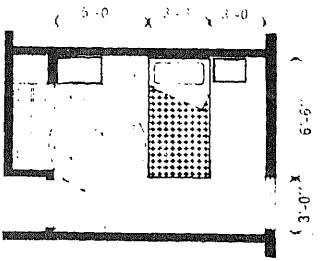
around beds are based on the need for a 5'-0"
elchair turning area on one side of the bed, a
clearance of 3'-0" where access or circulation
ir is necessary and a minimum clearance of
r areas. The accompanying sketches of fur-
oom units are intended as suggestions only.
ons are possible using the recommended

who are confined to their bed for extended pe-
, certain equipment controls may be needed
hould be placed within easy reach. Such con-
provided for a telephone, a radio, a television, a
ercom system to the entrance with a remote con-
ng device for the front door, an emergency alarm
t the superintendent or a neighbour, and light
the bedroom and the bathroom.

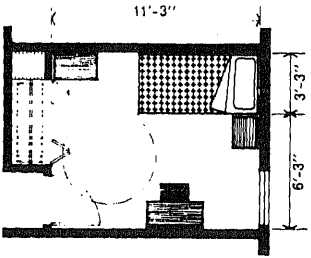
peze fixed to the head of the bed is preferred,
ling mounting is needed for a particular occu-
nanent ceiling eyebolt designed to hold a trapeze
mended, as it may inhibit future changes in fur-
gement. In particular, the location of the bed.
bolts must be fixed to a structural element and
mum load capacity of 300 pounds.



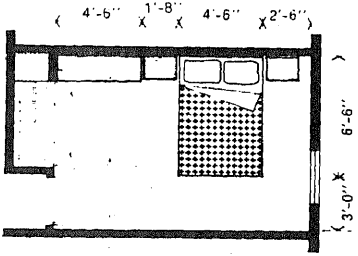
Suggested dimensions and clearances for a one-person bedroom



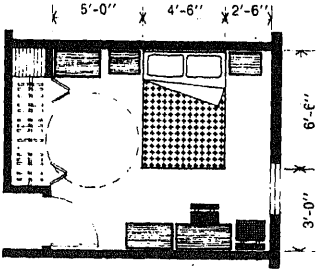
Alternate furniture arrangement in the same room



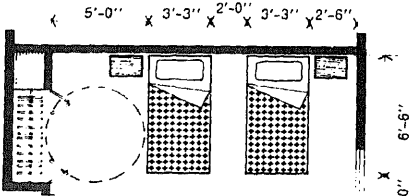
Bedroom for two persons in double bed



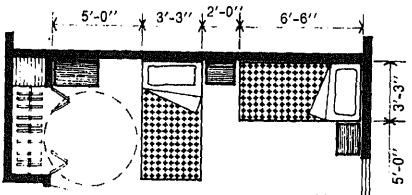
Bedroom for two persons in double bed –preferred room shape



Bedroom for two persons, including one handicapped person in twin a bed.



Bedroom for two handicapped persons in twin beds



A bathroom exclusively designed for one handicap may be unsuitable for others.

Bathrooms

Conventional bathroom design can present hazards to the disabled. They may slip easily on the hard, smooth surfaces of the bathtub or floor. If they have lost the feeling in their hands, arms, or legs, they are susceptible to burns from exposed hot water pipes or from the water itself. The most common problems, however, are impeded access because the door is too narrow, the great discomfort caused by lack of space for the manoeuvering of a wheelchair and the absence of grab-bars to permit safe and comfortable use of the bathtub and toilet.

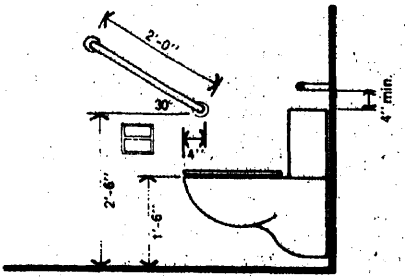
It is possible to design a bathroom to suit most disabilities and to reduce these hazards substantially. The following recommendations for bathroom facilities do not include specialized requirements for individual disabilities. For example, when the wheelchair user is assisted by a helper, the amount of space allowed must be increased even further. They do, however, provide reasonable conditions of comfort, safety and convenience for most disabled persons.

In households with two bathrooms, it is desirable to retain a conventional main bathroom for family use and to modify the second bathroom for use by the handicapped person.

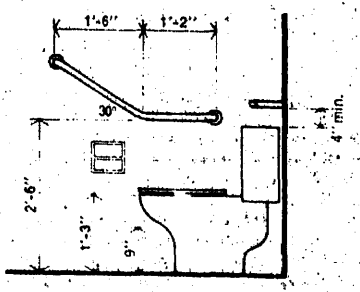
To accommodate the wheelchair user, the bathroom must be designed to make it possible for him to pass through the door, manoeuver beside or in front of the toilet, beside the bathtub or shower and in front of the washbasin. It also must provide space for storing a portable toilet chair, a portable hoist and/or a portable bath chair.

Some of the extra space required may serve more than one purpose. For example, the hoist or toilet chair may be stored in an area beside the toilet and this area also may be used for lateral transfer to the toilet from a wheelchair.

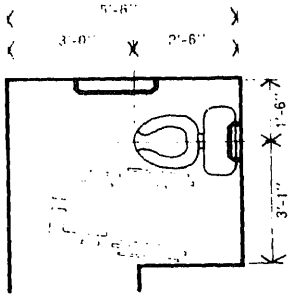
Cantilever type toilet mounted at 1'-6" height.



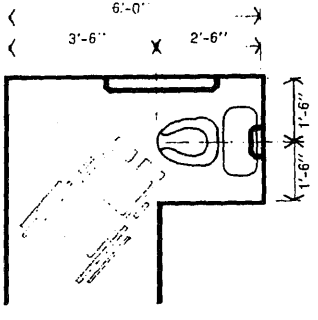
Conventional toilet. Recommend grab-bar type.



Required access area for side entry



Required access area for angled front entry



The Toilet

The toilet must be easy to use, as disability often results in the need for frequent visits to the bathroom.

The most convenient toilet is the wall-hung type with an elongated bowl or a toe space 9" high at the front. A heavy-duty toilet seat, cover and fixing bolts should be provided to allow for the uneven distribution of weight when the handicapped person transfers from his wheelchair. The seat should have an open front design for ease of access.

Although the desirable seat height for most handicapped persons is often given as 1'-6" to 1'-8" from the floor, a standard height installation with a separate and removable seat attachment is a more flexible arrangement in dwellings where able-bodied persons share the bathroom. A toilet chair also may be used to alter the seat height and it may serve as a shower chair as well.

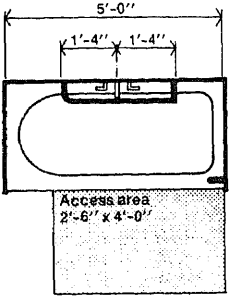
There should be a clear space measuring 2'-6" in width at one side of the toilet to allow for lateral transfer from a wheelchair to the seat and the space in front of the toilet should measure about 3'-6" to permit a frontal approach. Ideally, the user should be allowed a choice between the two types of access. Where space for lateral transfer only is provided, the left or right "handedness" of a disabled person may be a problem. This can be overcome by providing space on both sides; but this is an expensive solution and it may be difficult to achieve within the limitations of the plan of the unit.

The toilet should be so placed that the space from the wall behind it to the back of the seat measures at least 6", making it possible to position a wheelchair for lateral transfer. If the toilet seat cover or the water tank does not act as a back rest for the user, some other form of back support must be provided. Persons who cannot use their legs for support or balance rely heavily on this.

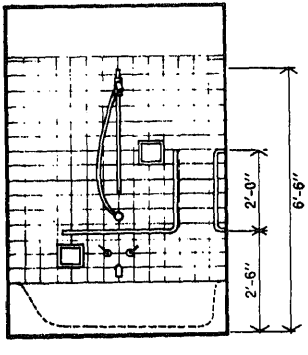
Grab-bars behind and on one side of the toilet are necessary. Space should be provided also for the installation of an additional grab-bar, since many ambulant disabled persons need support on two sides of the toilet.

The toilet-paper dispenser must be placed within easy reach. The old-fashioned type of holder that is not recessed is preferred by people with coordination difficulties and can readily be relocated to suit the needs of a particular individual. The best position for normal use is beside the toilet and about 10" in front of the edge of the seat.

lan of bathtub



Bathtub elevation



The Bathtub

The following requirements for bathtubs are based on the availability of mechanical aids such as a portable bathtub seat or a portable hydraulic lift.

There must be sufficient space beside the tub to make it possible to manoeuvre a wheelchair or hoist into position. Grab-bars also should be provided to assist both the ambulatory disabled and wheelchair users to enter. Grab-bars are essential to the handicapped person in transferring from crutches or a wheelchair to the bath seat, in transferring from the seat to the tub, in pulling himself up to a standing position to take a shower and in maintaining a secure standing position.

A raised bottom and high rim are desirable if the disabled person needs assistance in bathing, so that the helper will not strain his back. This can be achieved by raising the floor about 4" under the tub. However a standard tub with a 1'-4" rim and non-slip bottom is usable by most disabled persons.

Faucet and drain controls should be easily accessible from a sitting position in the tub. They should be of the lever type and are best located on the side wall. A thermostatic mixing valve is strongly recommended to prevent scalding.

Two recessed soap-dish units should be provided, one mounted low for use from the bath and the other mounted at a height of about 4'-0" for use while taking a shower. A hand-held, flexible, cable-hose shower unit also should be provided, set on a sliding mount. Shower curtain rods should be of heavier-than-normal construction. Sliding shower doors should not be utilized.

The Shower

Many disabled persons prefer a shower to a bath. The wheelchair occupant can use it without assistance and in hygienic terms, it is superior to a bath. Standard manufactured units are available; but because of their small size and the relatively high curbs with which they are equipped, they may be unsuitable for use by handicapped persons.

The recommended shower type is a built-in unit, with a floor that is a continuation of the bathroom floor. A low ¾" threshold is sufficient to prevent water spillage and the floor within the cubicle is sloped slightly towards a drain. A minimum area of 3'-0" by 5'-0" is recommended, with a clear access width of 2'-6".

eat is a necessity. This may be a portable or can-
e. An L-grab-bar provides assistance in rising
eat and ensures stability while standing. A vertical
lso should be provided to assist the user in trans-
m a wheelchair to the seat. A telephone type show-
be provided with a bath spigot for testing tempera-
et controls should be of the lever type.

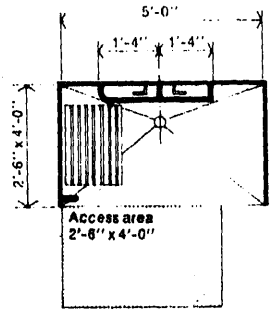
er design shown can be reversed, depending upon
ledness" of the user. Installation of the grab-bar
at therefore should be delayed until the actual
ls are known. The recommended shower floor is
d to concrete buildings but is not recommended
of wood-frame construction.

hbasin

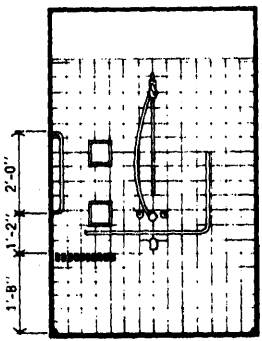
al washbasin height of 2'-7" is satisfactory for per-
heelchairs; but many persons with ambulatory dis-
who find it difficult to bend over prefer a height of
compromise height of 2'-9" is a solution that ap-
uit the needs of most individuals. Where possible,
basin should be located within reach of a person
the toilet.

lchair use, the washbasin should be a cantilevered
out from the wall at least 6" to bring the bowl
the user. The mounts should be designed for a min-
e load of 250 pounds. A clear space under the rim
" wide by 2'-2" high is also required. A washbasin
llow front apron is desirable. Hot water pipes
insulated for protection against burns. Where pos-
waste pipe should be extended and the trap lo-
e to the rear wall, freeing the space below the
n to accommodate a wheelchair. Insulation will not
sary where a thermostatic mixing valve is provided
the water temperature to about 115 degrees F.

Plan of shower



Shower elevation

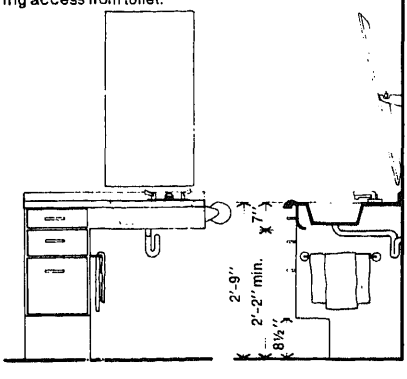


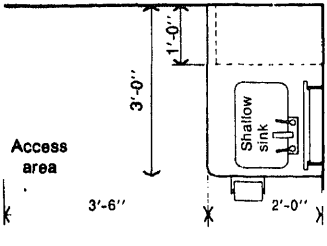
A vanity arrangement with a built-in washbasin meets the necessary standards and also may provide readily accessible storage space. The height of the counter should be 2'-9" with at least 2'-2" clearance between the counter and the floor. A bank of drawers or pull-out guides on one side of the unit may provide space for items that would otherwise be kept in a medicine cabinet. One drawer should be lockable to protect children from access to medicines or dangerous objects.

Lever handles should be used on the faucets. A spray attachment is useful if it can be extended as far as the toilet, where it may be used for washing a bedpan.

If the side of the vanity is next to a toilet, the toilet-paper dispenser may be attached to it. Also, the counter may provide support to the person using the toilet.

Sink mounted in vanity counter.
Note: Taps mounted off-centre, assuring access from toilet.





Layout

Given these criteria, various bathroom layouts are possible. Several sample plans are shown in the sketches. In each, the individual recommendations for the toilet, washbasin, bathtub and/or shower have been taken into account.

These layouts have a number of features in common:

1. The entry door is sliding or hinged; if hinged, it swings outward and leaves a clear opening of 2'-6".
2. A generous floor area is provided to allow wheelchair entry and manoeuvring. Sketch F shows the ideal case of a 5'-0" turning circle.
3. Where bathtubs are provided, they are a standard type, assuming that mechanical aids will be available for transfer from the wheelchair to the tub. A telephone type of shower is provided, with all controls mounted on the side wall.
4. Grab-bars are provided for the toilet, the bathtub and the shower.
5. Both washbasin and vanity arrangements are shown.

Layout *A* shows a small, two-fixture washroom.

Layout *B* is a compact, three-fixture bathroom with entry on the long side.

Layout *C* is similar, but the changed positions of the washbasin and toilet result in a narrower room shape. A sliding door is indicated.

Layout *D* shows entry on the long side, with a shower in place of the bathtub. Side access to the toilet is possible.

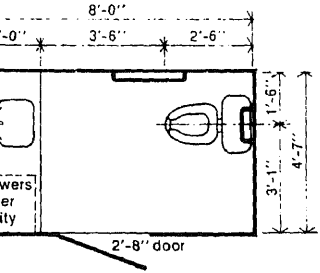
Layout *E* allows entry on the narrow side, which is useful in many situations. Although the plumbing arrangement is uneconomical, the position of the toilet allows side and front access.

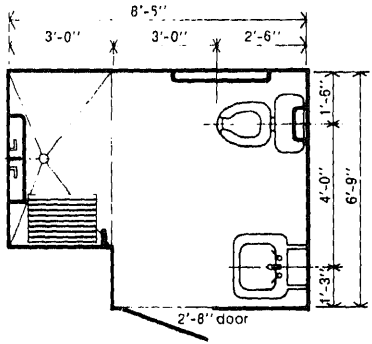
Layout *F* allows entry on the narrow side, as well as economical plumbing. Front access to the toilet is provided, and a complete wheelchair turning circle is possible.

Storage

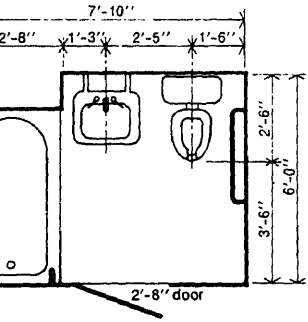
The conventional medicine cabinet set above the washbasin is not easily accessible to handicapped persons. If other cupboard space can be provided in the bathroom, the medicine cabinet should be replaced by an adjustable mirror or a mirror which has a lower edge mounted at a maximum height of 3'-6". If a medicine cabinet is used, a type should be chosen that has wooden or plastic shelves, since glass shelves are easily broken.

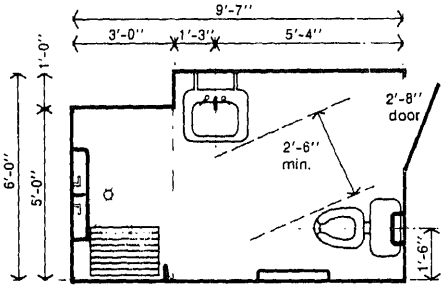
Layout D



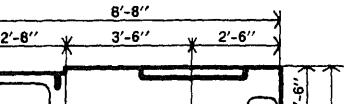


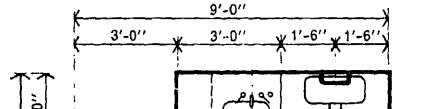
Layout E





Layout F





Grab-bars and Hoists

Grab-bars are an important element in bathrooms used by the handicapped. Those shown in the diagrams are intended to illustrate arrangements that will suit a wide variety of disabilities. Modification will be required to accommodate the needs of individuals. Grab-bars should be 1" to 1½" in diameter and have a clear space of 2" between the bar and the wall.

Grab-bars and all bathrooms equipment must be securely fixed to structural supports and be capable of carrying a 250-pound load. The disabled person will clutch at anything if he falls–a washbasin, a vanity, or a shower curtain. All bathroom fittings should be selected and located to provide maximum protection in case of accident and they should be capable of sustaining heavy use. For some disabled persons, a trapeze or travelling bar and hoist should be fixed to the ceiling to provide assistance in using the toilet and/or the bath. It is desirable to indicate at the time of construction structurally sound fixing points for these installations since their location will be based on individual requirements.

Other Features

Since most domestic accidents occur in the bathroom, a call button or other means of summoning assistance is necessary. The button should be located about 2'-0" above the floor. The recommended alarm system is described on page 25.

A supplementary ceiling-mounted source of radiant heat is recommended. In a bathroom with a tub, the heater should be located over the tub; but in a bathroom with only a shower, a central location is preferred. The equipment should be governed by a 20-minute time switch that is not connected to the bathroom light switch.

Storage Space

A generous storage area within the dwelling unit is necessary and a minimum of 200 cubic feet is recommended. The contents of the general storage area must be accessible from a wheelchair. Full-width bi-fold or accordion doors will make it easier to reach the stored items. Shelves are very useful in making maximum use of a limited area. These should be adjustable in height, with secure attachments. These shelves will be useful only up to a height of about 4'-8" for wheelchair users. Higher shelves also should be installed if ambulatory persons live in the unit. Shelves should be about 1'-4" in depth.

Ready access to closets may be provided by bifold, accordion, or sliding doors. The minimum clear opening should be 3'-0". Doors that require track or a floor-level guide rail are an obstruction. The clothes hanger rod whould be adjustable in height, from 4'-0" to 5'-0" above the floor. The shelf

he rod should be placed at a maximum height of
Shelves may be built in at the side of the closet. This
storage is convenient and reduces the amount of
e required in the unit. These shelves should be ad-
e or placed at heights up to 4'-8".

les

isabled people living in apartment buildings are con-
o their living unit for long periods of time. A balcony
welcome change of air, a chance to see street activ-
ace to grow flowers and enjoy the sun. It also may
s an escape route in case of fire.

s to the balcony is impeded if there is a threshold to be
d from the interior of the unit. A removable threshold
used to reduce problems of water penetration.

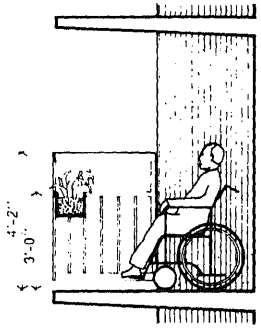
by a person in a wheelchair, the balcony should be
6'-0" deep. The design should aim to achieve an
of physical and psychological security. These factors
ticularly critical in high-rise apartment buildings.
ecessed balconies offer the combination of a view,
on and a sense of safety. Railings should be designed
v a view outward and down from a sitting position. A
ail should be provided at a height of about 2'-6", as
a separate upper rail at a height of about 4'-2". The
ail is necessary for security but will not interfere with
w from a seated position.

lowing additional guidelines are offered to assist in
ign of balconies:

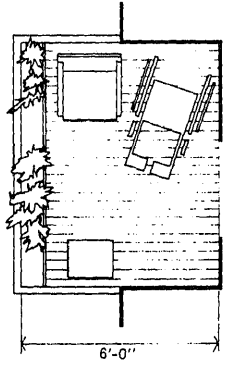
ey should protect the users from cold prevailing
umn and spring winds.
ey should allow maximum sun penetration.
ey should provide privacy from adjacent balconies
ey should provide space for flower planters and
wer pots.
ey may include overhead radiant-heating panels to
end the season of use.

clusion of balconies in high-rise buildings has not
ntirely successful, partly because of high winds, but
cause of feelings of vertigo on the part of the resi-
The height at which balconies virtually cease to be
aries from one location to another; but above rough-
welfth floor, they may be used only infrequently and
he twentieth floor, they probably constitute an un-
ary expenditure.

Section through balcony



Plan of balcony



Lighting and Electrical System

The physical act of changing light bulbs in ceiling fixtures is difficult or impossible for many disabled people. Ceiling fixtures with a retractable cord are desirable so that the light may be pulled down to a lower height when the bulb must be changed. Fixtures with more than one light bulb are useful also, so that when one bulb burns out, some light continues to be provided until a replacement can be made. Rheostat light controls are desirable to allow for variation in individual need and preference.

There should be a switch to a light fixture or to an electrical outlet at the entrance to every room. It should never be necessary to pass through an unlighted area to reach a switch. Convenience outlets should be placed not less than 1'-9" above the floor.

Light switches should be no lower than 2'-9" and no higher than 3'-6" from the floor. This facilitates their use by persons in wheelchairs and makes it possible to operate them with the elbow. A large rocker switch can be operated easily by those with manual disabilities.

Light switches with locator lights should be provided in the entry hall, the bedroom-bathroom corridor, the bathroom and the bedroom. A generous number of wall-plug outlets throughout the unit contributes substantially to the flexibility of the lighting system.

The entrance doorway to the apartment unit should be brightly illuminated for easy identification and operation of the key and lock.

The living area needs strong illumination for such activities as reading and sewing. Overhead lighting with a rheostat control may be used, augmented by a freestanding lamp.

The dining space often serves a dual purpose as a work, hobby, or play area. These functions require differing qualities and intensities of light and varying needs may be met by provision of a fixture with a rheostat control.

In the kitchen, wall or cabinet-mounted strip lighting should be installed to throw direct, shadow-free light over work surfaces, the stove and the sink area.

The design of lighting in the bedroom should be sufficiently flexible to permit the use of a variety of lamps and fixtures, including lampstands, bed lights and dresser lamps. Sufficient duplex outlets should be provided to make this possible.

In the bathroom, there should be a light over the washbasin, in addition to an overhead lighting fixture.

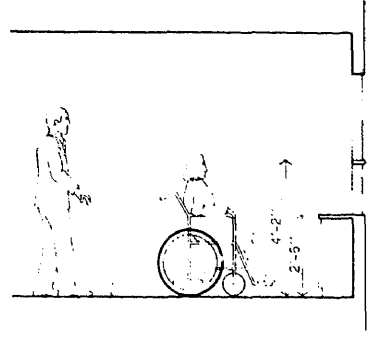
Finally, in all types of closets a light should be provided, preferably one that is activated when the door is opened.

Windows

Windows should be designed so that the lower sill is no more than 2'-6" above the floor. This will allow a seated person to look outward and down. A sturdy railing should be provided at a height of about 4'-2", so that the disabled person may stand at the window and look out with a sense of security. Window sills wide enough for plants are very desirable. It should be possible to clean outside windows from inside the unit.

Sliding glass doors may be an additional source of natural light and air. Because they tend to create drafts, however, they are not recommended as the only source of fresh air in the room. Double-hung windows should not be used unless they are counter-balanced to ease operation. Casement or hopper type opening windows are preferable, as they can be opened easily with one hand. Window controls must be easy to grasp, operate and mounted no higher than 4'-6" above the floor.

Recommended window section



loor Coverings

pe level, easy to clean and covered with a non-. People using wheelchairs find that travelling ting requires more effort than an uncarpeted they generally accept this disadvantage in the other benefits. Carpeting is easily maintained, e transmission of noise from wheelchairs and as a pleasing appearance and it contributes to f a room. It also reduces the seriousness of alls. For handicapped children who are en-crawl, a carpeted floor is an advantage. Al-y not be possible to install special floor finishes ividual needs, carpeting appears to be particu-s a directional signal for the blind and for those esight.

ting is used, it should be a heavyweight, high-, with a short pile. Some problems have been re-carpeting rippling under wheelchair traffic caus-in movement. A glued carpet may overcome

d maintain their non-slippery qualities even e wet. In bathrooms, small unglazed ceramic mmended as they have excellent non-slip rticularly if the edges are square rather than

canes and crutches for support are particularly o accidents on slippery surfaces. Terrazzo or flooring at main entrances or in bathrooms is hen wet and should not be used.

xing and polishing floors is difficult for the d, surfaces that rely on this treatment for mainte-ppearance should be used sparingly. Hard-with a permanent finish require minimum mainte-ave an attractive appearance. Non-slip waxes for hard surfaces that need maintenance, but n difficult to apply.

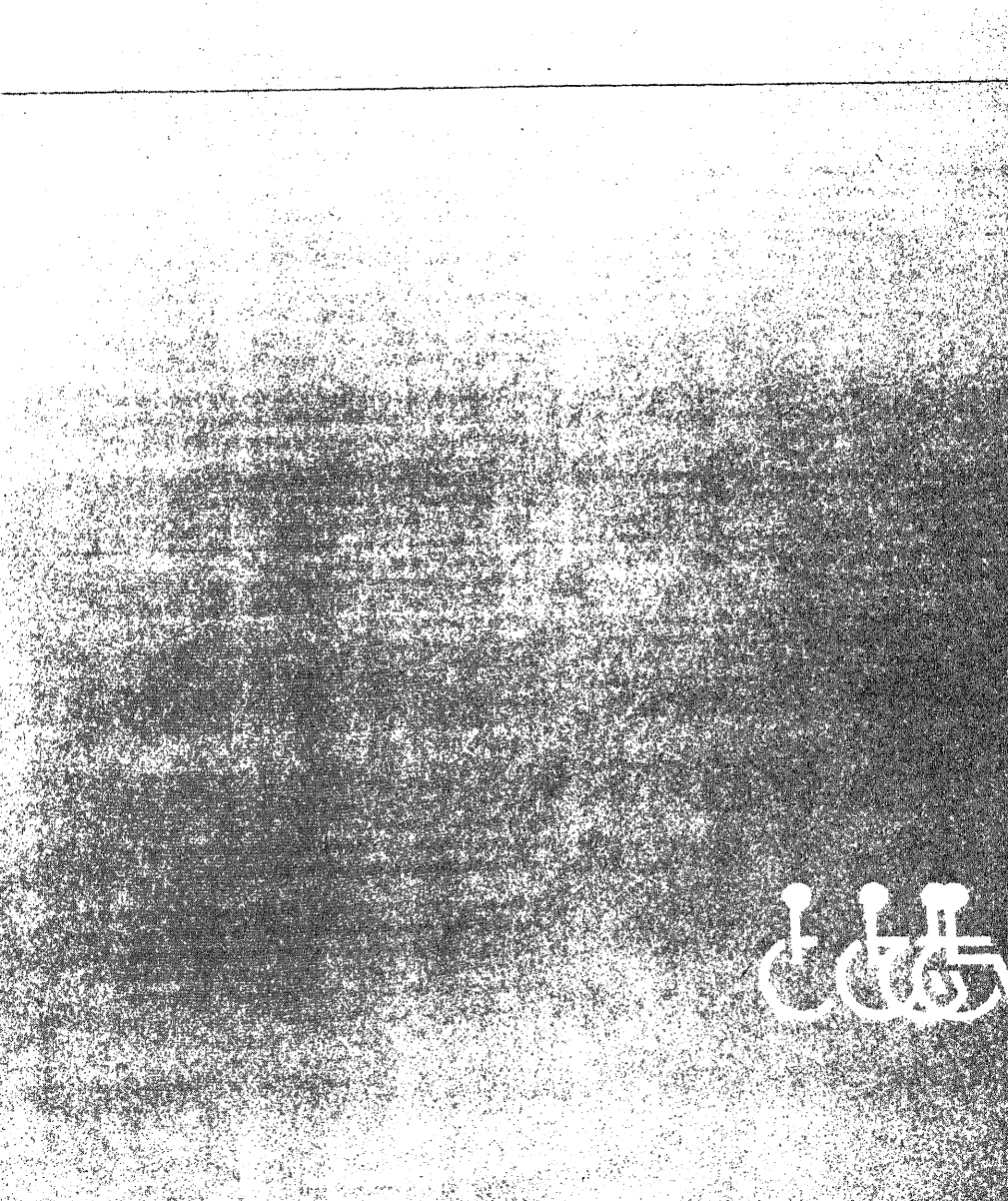
Decoration

ould be easy to clean and maintain. Flat paint on commended; semi-gloss is acceptable as a fin-ns and is fully washable.

s, carpets and other furnishings should not have rns. They may be mistaken for obstacles or ob-n the floor and may cause accidents if people hem. Patterned surfaces also may conceal real t can be seen clearly on unpatterned surfaces.

For persons with certain disabilities, particularly those involving poor coordination, it is desirable to emphasize the edges of door and window openings by colour symbols.

The choice of colour for wall surfaces is largely a subjective decision. Ideally, the individual occupant should be able to choose his own colour scheme. Where this is not possible, a range of light, unobstrusive colours is recommended for the interior of the residential unit, to allow maximum flexibility in the choice of furnishings and to increase the apparent size of small rooms. In public areas, the use of bright colours and various textures is desirable.



ns for housing the handicapped are unique to housing units, such as detached, semi-de- ow houses. Many internal design features that ded in houses have already been discussed on 7.

he House

approach to the main entrance of the house otected by means of an enclosed porch or ep it dry and free from ice and drifting snow.

l area should be provided outside the entrance, least 5'-0" by 5'-0" clear of the swing of the ved area should be of a smooth, hard material, crete or asphalt, and should slope gently away ance to drain water from the threshold area.

sable entrances should be provided to afford scape routes in case of emergency. Entry doors least 2'-10" wide.

are not recommended, as handicapped persons icult to operate. They should be used only closed porch cannot be provided. An enclosed etween the garage and the house makes a con- nce, but prevailing winds must be considered nel may be created.

ossible for a disabled person to open a locked with one hand. A grab-bar on the door frame ck may be useful for support. There should reshold, or other impediment at the entrance, xtreme climates a ½" weather bar may be

Inside the entrance, there should be enough clear space to manipulate a wheelchair. A minimum of 5'-0" by 5'-0" is recommended, with an area 2'-0" by 5'-0" clear of the swing of the door. Since this space will be used also to brush snow from shoes, clothes and wheelchairs, a washable, nonslip floor material should be selected.

A coat closet with shelves for overshoes, hats and similar small articles should be provided in the vestibule, and there should be a seat or a chair available for those who must sit down to put on or take off outdoor clothes.

A lockable delivery box is recommended for milk, bread, letters and other articles that are brought to the house. It should be placed about 2'-9" above the floor and designed so that it can be emptied from inside the house.

To avoid drafts, the vestibule at each external door should be heated; or alternatively, weather stripping should be installed to prevent seepage of cold air into the living area.

The vestibule should lead directly to the interior of the house, without the necessity for a sharp turn to the right or left.

Carport and Garage

A car can be used by most disabled persons if the controls are properly modified. Parking space should be provided with a minimum width of 12'-0"

Access from the parked car to the house should be direct. The route should have a hard, level surface and should be protected from the weather. There should be enough space on the house side of the parked car to allow the driver or passenger to open the car doors fully.

Driveways should be short to minimize snow clearance, and parking should be as close as possible to the public right-of-way. Snow-melting by an underground heating system is desirable where costs permit. An outdoor electrical outlet should be provided for a block heater.

A heated garage is preferred to an open parking space or a car port. The chores of cleaning ice and snow from a car and starting it in cold weather are more than most handicapped drivers can manage alone. Also, disabled persons are very sensitive to drafts and abrupt changes in temperature.

Electrically operated garage doors are preferable to manual doors. They should be controllable from a wheelchair parked at the side of the car in the garage, and from a point outside that is accessible to the seated driver by touch or by radio control.

A trapeze hung from the ceiling of the garage is often used to transfer a disabled person from a wheelchair or other ambulatory aid to a car. A permanent eyebolt suitably located and securely fixed to a beam or roof truss should be provided. The eyebolt should be capable of carrying a load up to 300 pounds.

A two-way switch should be provided to allow the garage light to be controlled from inside the house or from the garage.

Laundry

Provision should be made for washing, drying and ironing clothes on the main floor of the house, unless there is an easy means of access to the basement.

A combination washer/dryer eliminates the need to lift bundles of wet clothes. A front-loading machine with front-mounted controls is preferred. It may be placed on a platform to raise it to a convenient height. There should be a 5'-0" clear work space in front of the machines.

If an automatic clothes dryer is not available, a drying line or rack will be needed. Since these are normally difficult to use, it is best to study the individual's capacity and requirements and work out the most practical solution suited to the need.

The standard portable ironing board is a flexible piece of equipment, but it is hard to set up. A built-in board adjustable to a height of 2'-0" to 2'-9" is preferable because it is more stable.

Home Elevators

Many existing houses are two or three floors high and most have a basement. A small personal elevator will give the disabled person access to these floors. The elevator is necessary also where an existing garage is at grade, but the main floor is raised several feet–here the elevator offers almost the only possible entry.

An alternative to a home elevator is a stair lift, but this cannot be used with a wheelchair.

Appendices
and bibliography

Fokus Society is a private Swedish organization that sors research, builds dwellings and provides services severely handicapped people. The president, Dr. S. O. gard is also chairman of the Department of Handicap arch at the University of Göteborg. The Fokus principle e of dispersal. About 15 to 20 specially designed units cattered within normal family-type apartment buildings. e special facilities are provided on the ground floor, but are shared with other tenants. The dwelling units reflect gh degree of concern for appropriate detailing. The hen and bathrooms are designed with counters and pment that are completely flexible in height, to suit any bility.

mportant to note that the Fokus units are intended for severely disabled who would otherwise be housed in tutions. Those less severely disabled can benefit from a s of government grants and subsidies that allow them to ify their own dwellings.

minar was held in September 1972 at CMHC's head of- in Ottawa, to discuss the work of the Fokus Society. A rt of this seminar is available from CMHC and includes mplete summary of the society's activities as described r. Brattgard.

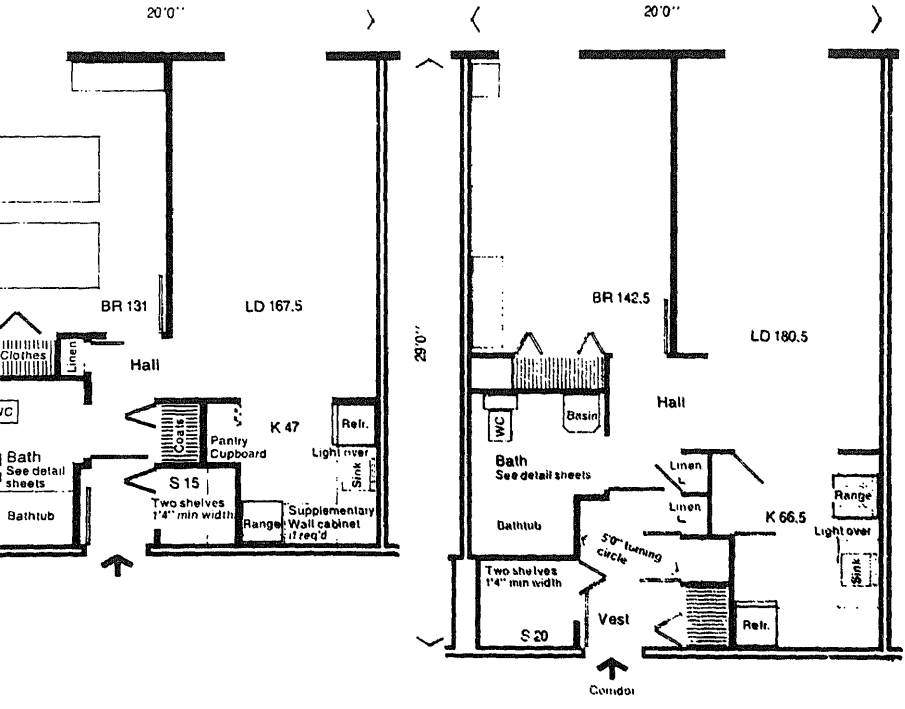
The one-bedroom unit is a typical CMHC senior citizen unit modified to meet the standards for occupancy by a handicapped person. The original senior citizen unit also is shown for comparative purposes.

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unit
ens
rea: 480 sq. feet.

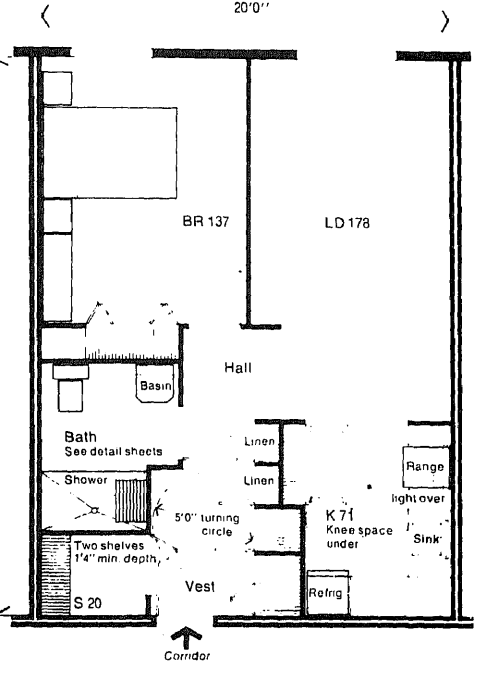
Guide Plan

Handicapped
1-bedroom unit
Total net area: 520 sq. feet.



uide Plan

andicapped 1-bedroom unit
otal net area: 555 sq. feet.

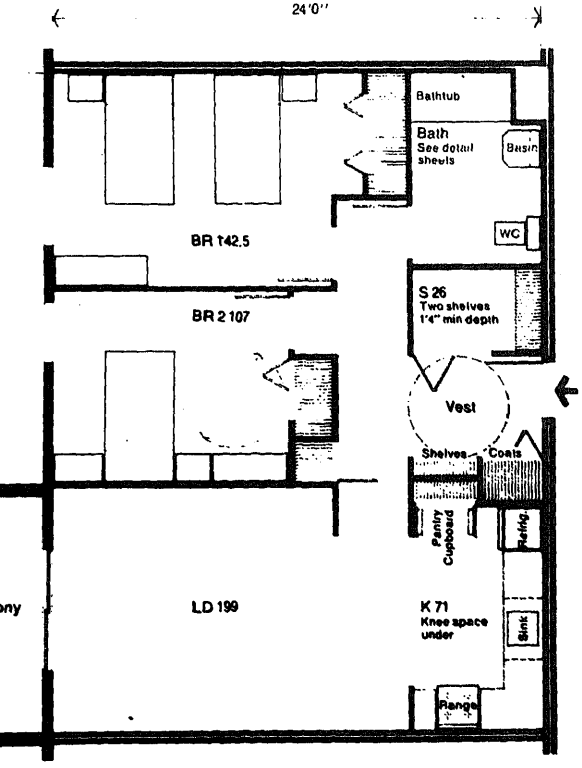


ote:
r apartment buildings
th internal corridors
d communal facilities.

edroom unit is designed for occupancy of the
oom by two able-bodied persons and occupancy
ndary bedroom by a handicapped person.

Guide Plan

Handicapped 2-bedroom unit
Total net area: 780 sq. feet.



nt buildings
l corridors
nal facilities.

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graphy

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BYGGNADS TILLGÄNGLIGHET FÖR HANDIKAPPADE

Riktlinjer för nordiska byggbestämm

NKB-skrift nr 19
September 1974

ACCESSIBILITY OF BUILDINGS
TO HANDICAPPED PERSONS

Guidelines for nordic building regulations

NKB-publication no 19
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Nordiska Kommitten for Byggbestammelser, NKB, ar ett samarbet
organ för de nordiska ländernas centrala plan- och husbyggnad
myndigheter. Kommitténs arbete syftar till en samordning av
byggbestämmelserna i de nordiska länderna. I kommittén är föl
myndigheter representerade:

Danmark:	Boligministeriet
Finland:	Ministeriet för inrikesärendena
Island:	Skipulagsstjórinn
Norge:	Kommunal- og arbeidsdepartementet
Sverige:	Statens planverk

The Nordic Committee on Building Regulations NKB, is a joint
committee for the national building authorities in Denmark,
Finland, Iceland, Norway and Sweden. The object in view in t
activity of the committee is the co-ordination of the techni
building regulations in the five countries.

PREFACE

The Nordic Committee on Building Regulations has approved these guidelines referring to the accessibility of buildings to handicapped persons and which are to be used when building regulations are issued in any one of the Nordic countries. No separate regulations are to be drawn up for the handicapped; instead certain guidelines are to be integrated into the building regulations.

It is up to each country to decide to what extent the guidelines are to be included in the set of national regulations.

Nordic general approvals (type approvals) and Nordic building standards should be introduced to facilitate the practical application of the regulations. In 1973 the NKB suggested that the organizations responsible for standardization issues in the Nordic countries might draw up a set of Nordic standards and revise present standards so as to include these guidelines for handicapped persons.

These recommendations have been drawn up by the NKB's Handicap Group consisting of Hans Örnhall, Chairman, the National Board of Urban Planning, and Sten Söderström from Sweden, Ole Haslund, Ministry of Housing, from Denmark, Odvar Hedlund, Ministry of Municipal Affairs and Labour, from Norway and Pentti Pantzar, Ministry of the Interior, from Finland. The Group was appointed in 197[illegible] and in 1973 circulated an official NKB draft within the Nordic countries for comment.

Replies received on the subject of the draft have led to certain amendments to the text and to the drawing up of a detailed corallary to the guidelines. Points of view were also expressed which lay outside the NKB's terms of reference.

There was complete unanimity among the authorities in the Nordic countries responsible for the task of drawing up these NKB guidelines for the accessibility of buildings to handicapped persons. The replies received on circulation of the draft have strengthened our belief in the need for guidelines and our unanimity concerning the form which those guidelines should take.

September 1974

1 Introduction

1.1 Definitions

A number of definitions were attempted in drawing up these regulations.

Persons with impaired vision

Persons with impaired hearing

Persons with difficulty in walking

Persons with reduced ability for moving arms and hands

Persons confined to wheelchairs

Persons with a low IQ or with mental deficiencies causing difficulty in orientation

The term public way is defined as meaning a street or road, car park, common land etc

The term building is defined as meaning

1. Residential premises in the form of blocks of flats or singlefamily houses.
2. Public premises in the form of a government or municipal building, cinema, public baths, theatre, shop, kiosk, transport terminal for both local and long-distance traffic by land, sea or air.
3. Work premises in the buildings mentioned above plus office buildings and factories.

When the work of the Group was completed in 1973 the following laws applied in the Nordic countries:

1.2 Laws

DENMARK

Building Act § 6:

> "In the interests of general safety, fire protection and public health the Ministry of Housing issues a building statute containing directives governing the design, construction and fittings of buildings
>
> .....
>
> Clause 3. With reference to residential buildings erected for the purpose of letting or for sale as private residences and to building which are open to the general public, the statute may include direc-

A circular issued by the Ministry of Housing on 23 March 1972 contains directives referring to government buildings and works and to buildings financed with state funds, with the exception of residential buildings.

> § 1. "The purpose of this circular is to make it possible for physically disabled persons (i.e. persons confined to wheelchairs and persons with impaired vision or hearing) to use buildings and other facilities open to the general public and buildings containing places of work where the physically disabled can be employed."

FINLAND

Building Statute, § 85 a:

> "In construction buildings containing premises to be used by the public proper attention should be paid to the fact that these should also be accessible to persons whose physical mobility or orientational ability is limited as a result of advanced age, physical injury or sickness."

NORWAY

There are at present no general regulations which apply in this sphere in Norway. The general building regulations issued in 1969 and which apply to buildings of all types, do however contain certain provision for the needs of persons with "reduced physical mobility".

SWEDEN

Building Ordinance § 42 a:

> "The parts of buildings open to the general public or which are used as a place of work shall insofar as this is possible be designed so as to afford access to persons whose physical mobility and orientational capacity is impaired as a result of advanced age, physical injury or sickness."

2 Route

2.1 Outdoor route

General requirements:

An outdoor route linking a public way with the entrance to a building must have a firm surface, be easy to walk on, easy to find, free of unexpected obstacles, suitable for use by handicapped persons and wide enough to allow a wheelchair to be turned round on it.
It must be possible for at least one of the entrances to a building to be used by persons in invalid carriages. This entrance must be easy to find and clearly marked. If only one entrance is accessible, this must be given special markings.

Quantified requirements:

Routes must be at least 1,3 m wide. The maximum permissible gradient is 1:12 and the maximum permissible height above the surrounding ground 0,60 m. For remarks on handrails see 2.2.3 och 2.2.4.

2.2 Indoor route

2.2.1 General

General requirements:

Routes linking the entrance to a building with its various parts must be easy to negotiate on foot, simple to find and suitable for use by handicapped persons. If a building has several entrances, it must be possible to reach all floors from at least one of the entrances that are accessible.

Quantified requirements:

Routes must be at least 1,3 m wide.

2.2.2 Doors

General requirements:

Doors along routes must be easy to see and accessible to handicapped persons.

Quantified requirements:

Doors with a minimum modular dimension of 9 M (M = 10 cm) may be accepted.
The cabin may have a maximum height of 2,035 m

Lifts

General requirements:

If lifts are available, at least one of these must be designed so as to be accessible to handicapped persons.

Quantified requirements.

Lifts of a shape and size which will accommodate a person in a wheelchair may be approved.
Doors must open to give a clear passage of at least 0,8 m.

Control panels should be fitted horizontally and at a maximum height of 1,2 m and handrails at a maximum height of 0,9 m in order to be approved.

Differences in level indoors

General requirements:

A ramp complete with handrail along both sides in addition to stairs must be provided in cases where there is no lift.
Handrails must be easy to grip and easy to hold on to.

Quantified requirements.

The maximum permissible gradient for ramps is 1:12 and the maximum permissible height 0,6 m.
Handrail height may not exceed 0,9 m.

Premises

Sanitary facilities (bathrooms, showers and WCs)

General requirements:

All buildings must contain at least one WC which can be entered without difficulty and used by a handicapped person. If a building consists of several storeys or is subdivided along some other lines, a number of WCs accessible to handicapped persons must be provided.

Quantified requirements:

Only sanitary facilities which can be used by a person

3.2 Other room accessories

General requirements:

Telephone booths, telephones, coat racks and so on must be easy to locate and at a height which renders them readily accessible to handicapped persons.

Quantified requirements:

Loud-speaker systems equipped with a loop accessory may be approved.
Telephone booths which can be used by a person on a wheelchair may be approved.
Telephones where the dial etc is 0,9 m above the floor may be approved.
Rails on coat racks fixed at a height of 1,2 m above the floor may be approved.

3.3 Controls

General requirements:

Control buttons in lifts, bells, hall telephones, letter boxes, door handles, window handles, washbasin taps, switches and so on must be designed so that they can be used by handicapped persons.

Quantified requirements:

Controls positioned 0,9 - 1,2 m above the floor may be approved.
Acoustic signals supplemented by optical and vice versa may be approved.

3.4 Signposting

General requirements:

Signs, symbols and text must be presented in a manner which renders them easy to read and easy to grasp.

Quantified requirements:

The minimum permissible text height is 12 mm.

Comments

Definitions

A number of the bodies to which the draft in question was circulated consider the definition of handicap too limited. In the view of the Group these considerations do not come under the terms of reference of the NKB. It feels however that they are of sufficient interest to merit a comment here.

Some of the bodies which commented on the draft draw attention to the fact that a number of different categories of person may be regarded as physically disabled for a variety of reasons. The largest group they have in mind here comprises pregnant women, mothers with prams and persons with handicaps due to age.

Handicaps of which no special mention has been made are muscular and neuroatrophy allergies, co-ordinational difficulties, asthma, psoriasis and mental deficiencies. All persons suffering from such handicaps experience difficulties in connection with the specific design of various buildings. Fabric floor coverings are, for instance, very often considered to entail a risk of triggering off allergies. A person who is oversensitive to nickel cannot touch a metal handle containing nickel without risking developing an allergic form of eczema. Plastic handles very seldom cause problems. Persons who are unable to feel heat, can very easily burn themselves with hot water or on taps if the temperature of the hot water supply is not regulated (From 1972 regulated to max 65 °C in new buildings in the Nordic countries).

An asthma victim often suffers in smoky or dusty premises. For people such as these it is essential that the ventilation should be good and that there should be a separate smoking room for smokers. Air humidity and temperature should also be kept at a suitable level. Public baths with chlorinated water can very often not be used by persons suffering from allergies. Many people are oversensitive to the epithelium of animals. A wish has been expressed to see this fact taken into account to a greater extent. Similarly, there ar many types of paint which can cause eczema. People suffering from various mental handicaps have special requirements regarding a quiet, soundproofed environment. Some people experience difficulty in using lifts which are entirely enclosed. The introduction of glazed lift shafts and

problem when designing buildings can help to avoid many orientational difficulties. Truly unequivocal rules of thumb have yet to be established. It is possible that current research into the problems of persons with impaired vision will produce some results applicable also for persons with a low IQ. Mention should be made in this context of an information bulletin (No D9:1972) issued by the National Swedish Institute for Building Research and entitled "Accessible Towns - Workable Homes", in which these problems are discussed.

Co-ordination

The Group wishes to point out the importance of following up co-ordination of the internal environment with co-ordination of the external environment. In the sphere of transport, for instance, the Nordic countries need better co-ordination of terminals, road networks and transport services in respect of their accessibility to handicapped persons.

The purpose-oriented design of buildings of which the NKB guidelines constitutes an example should be followed up by similar guidelines referring to areas outside the boundaries of actual sites, e.g. the pedestrian environment in the neighbourhood of buildings.

Branch regulations for different products also need to be drawn up. These should probably be linked to the present system of financing, i.e. state and municipal loans and subsidies.

Extra allocations of invalid carriages for outdoor use and indoor wheelchairs plus more widespread use of electrically powered wheelchairs may mean that spatial requirements will have to be increased. Standardization of certain functional dimensions of all types of wheelchaires would appear to be desirable.

Alterations and maintenance

Greater attention should be paid to the problems of alteration and maintenance in order to provide a further assurance of achieving a suitably adjusted physical environment within a reasonable space of time.

Outdoor route

An outdoor route will link, for example, a public footpath or car park etc and the entrance to a building. Parking spaces designed to accomodate wehicles belonging to handicapped persons need to be at least 3,5 - 4,0 m wide or thereabouts. No posts or obstacles in the way of persons with impaired vision may be present along a

structure which differs absolutely clearly from that of the surrounding ground. No slope along the route should provide a greater difference of levels than 0,6 m unless intermediate landings are provided. A landing should have at least the same width as the route itself. Ramps should be heated and/or covered to provide protection against snow and ice. Ramps should be given a warning edge. (In Denmark the maximum gradient of 1:20 is an official requirement).

Entrances to buildings

In the case of public buildings, the entrance to be accessible to persons in invalid carriages should be the main entrance. If in the case of other buildings an entrance other than the main entrance is accessible to persons in invalid carriages, this should be clearly indicated by signs leading from the main entrance to the entrance in question (which may not incidentally be a tradesmens' entrance). If the entrance doors do not have automatic controls, a space alongside with a width of approximately 0,7 m is necessary. The area in front of the entrance door should be flat (Max. gradient 1:50). Automatic mechanisms in entrance doors (e.g. automatic closers) should give rise to a maximum opening pressure of 25 Newton and should hold doors open for approximately 6 seconds.

Indoor routes

At present requirements in the Nordic countries differ as to how buildings should be rendered accessible, and none of the countries completely satisfies the requirements in these regulations.

Sweden has regulations governing the accessibility of places of work, all public premises, transport terminals and entrances to blocks of flats. In addition, in the course of 1974 a proposal is to be put forward calling for individual dwellings to be rendered accessible to handicapped persons either on short visits or staying temporarily (this includes both flats in blocks and single-family houses). This means that entrances, doors inside the dwelling, one bathroom with WC, kitchen, living room and one bedroom must be designed with dimensions which render them accessible (regardless of whether the building is equipped with lifts or not).

facilities, living room and one bedroom should be situated so as to be directly accessible from entrance level.

It should still be possible to render buildings containing workplaces on more than one level accessible without needing to install lifts. In such cases the premises should be organized so that all categories of facilities are available on the entrance floor which is readily accessible. Thus, a canteen in such a building may not be located solely on an upper floor.

Houses containing accommodation for one family only may be designed without making the entrance directly accessible to handicapped. They should however be planned with provision for the addition of an outside ramp if necessary.

Doors

The 9 M requirement refers to internal doors which provide a clear passage of at least 0,76 m when opened at an angle of 90^{0}. Should the door be fitted with a closing mechanism, a clear space with a width of 0,7 m may be required alongside.

Glass doors and glazed partitions must be clearly indicated so as to eliminate the risk of collision for persons with impaired vision.

Hinged doors with automatic opening mechanism should be located in such a way as to avoid the risk of collision or be fitted with safety divices.

Lifts

According to the definition of a building adopted in these guidelines lifts are in principle required in all cases where a building has more than one storey. Even though certain deviations are permitted in that lifts are not compulsory in residential buildings of two and three storeys, all floors are nevertheless required to be made accessible.

The size of lift cages is to be standardized. The present international ISO standard does not take the needs of the handicapped into account. The minimum necessary size for lift cages is, for example, dependent upon the degree of automation of the doors, the position of control panels and so on.

irements referring to accuracy of adjustment lie
in the limits set by a maximum threshold height of
5 m.

space in front of lift doors must be at least 1,30 m
a downward flight of stairs should not be situated
ctly opposite.

erences in level indoors

s must always be regarded as emergency solutions and
never replace stairs and/or lifts.

rails should project approximately 0,3 m beyond the
t and last steps of flights of stairs to make matters
ler for persons with impaired vision. The height of
rs and depth of treads for flights of stairs in,
example, public buildings should be 0,15 m and 0,30 m
ectively.

tary facilities

requirement that a toilet should be easily accessible
he physically disabled means that the compartment
ld be adjacent to other toilets and be designed and
pped in such a way that a person in a wheelchair can
h all appliances etc with the door closed and without
iding with the sanitary fittings. There should pre-
bly be a clear space of 0,80 m on one side of the WC
llow a wheelchair to be reversed up the back wall.
washbasin should be fitted on the other side of the
o as to permit its use by a person seated on the WC.

everal toilets are provided with a clear space along
side of the WC, one of these should preferably be
rsed so as to provide both for persons handicapped
heir right side and persons handicapped on their left.
nly one toilet for handicapped persons is provided,
sides of the WC should be left clear and the wash-
n should be fitted at some other point in the compart-
. An area of approximately 2,10 x 2,10 m is necessary
rder to satisfy these requirements, which is also
rent from the NBI recommendations (Norwegian Building
arch Institute).

dimensions specified in the Swedish Building Regula-
s (Svensk Byggnorm), i.e. 1,7 x 1,7 m, call for a

Coat racks should be fitted with a protective side panel and should be without projecting shelves. Otherwise, the coat rack should be located so as to afford protection against collision.

Control mechanisms

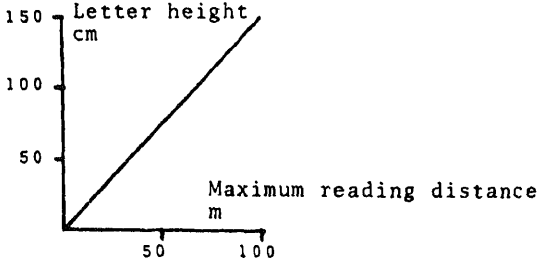
No official requirements have been drawn up with reference to the location of electrical wall sockets in view of the installation systems current. It goes however without saying that a preferable height for these is 0,9 m above the floor.

Requirements whereby acoustic signals should be supplemented by optical are to be applied wherever necessary, e.g. hall telephones serving pharmacy premises but not door bells to ordinary dwellings.

Signposting

The size of text specified assumes that it is possible for the reader to come right up to the sign, which is to be placed at a height of 1,4 - 1,6 m above ground level. If there is a considerable distance between the sign and the reader, the size of the text should be increased proportionally as shown in the figure below.

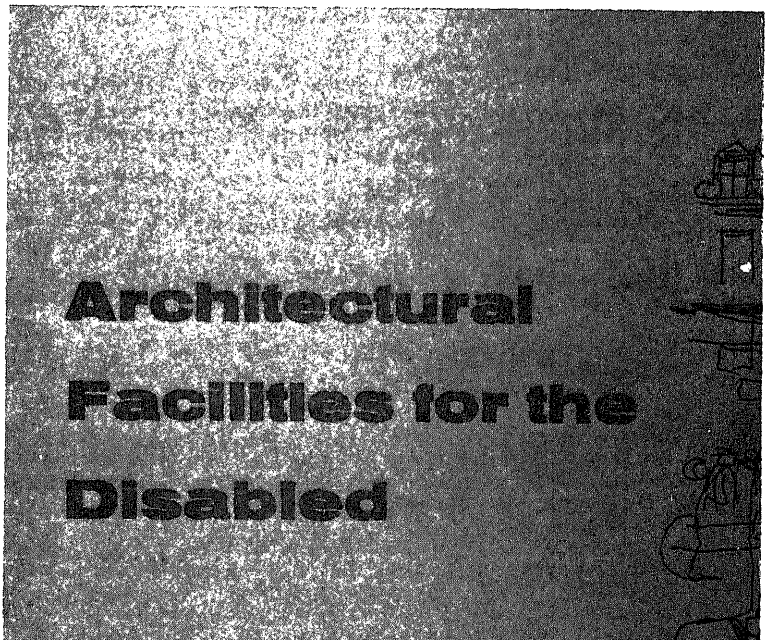
The easiest way of calculating necessary letter height is to use the diagram reproduced below. This is applicable for a visual acuity of > 0,1.



The diagram is taken from bulletin D9:1972 "Accessible Towns - Workable Homes", published by the National Swedish Institute for Building Research.

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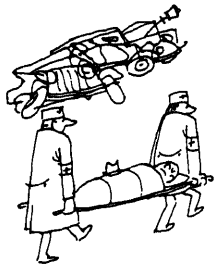


NEDERLANDSE VERENIGING VOOR REVALIDATIE (N.V.R.)
(The Netherlands' Society for Rehabilitation)
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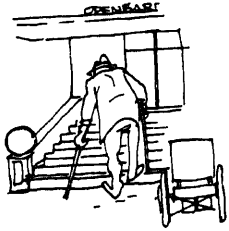


THIS can also happen to YOU!





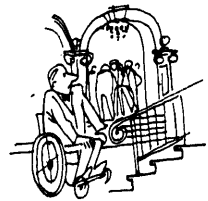
AFTER REHABILITATION YOU AGAIN TAKE YOUR PLACE IN SOCIETY.



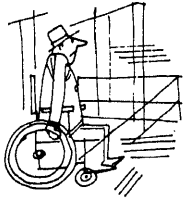
AND THEN THE „PUBLIC" BUILDINGS THAT YOU USED TO VISIT, OR YOUR FRIENDS'



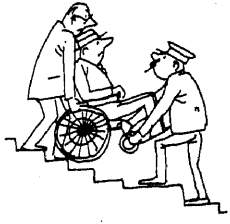
YOUR PARKING PROBLEM IS NOW STILL BIGGER



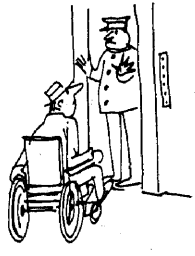
INDEPENDENT VISITS TO MUSEUMS, THEATERS, RESTAURANTS ETC. APPEAR TO BE IMPOSSIBLE



AND THEN YOU MEET WITH INNUMERABLE SMALL AND BIG OBSTACLES



YOU CANNOT GO TO YOUR WORK OR SCHOOL BECAUSE OF THRESHOLDS, STEPS, STAIRS.....



OR IT IS THE LIFT THAT IS TOO SMALL OR THE NON-ADAPTED TOILET THAT EXCLUDES YOU



YOUR TRANSPORT AND RECREATION POSSIBILITIES ARE STRICTLY LIMITED

CAN NOTHING BE DONE ABOUT THIS?
YES, CERTAINLY,

by taking into consideration an entrance without obstacles, when planning new buildings. Many benefit from this, especially the handicapped, the aged and mothers with perambulators.

IN THIS WAY YOU HELP TO OPEN DOORS:

principals: by including "adapted building" in your building programmes
architects: by paying attention to accessibility, free passage and usability in your plans
municipalities: by insisting on the special building regulations being applied

ISRD = International Society for Rehabilitation of the Disabled
ICTA = the ISRD Committee on Technical Aids, Housing and Transportation. ICTA is housed by the Swedish Institute for the Handicapped, Stockholm.
The ICTA Information Centre serves as an international centre for documents concerning technical aids for the physically handicapped. The Information Centre has the following tasks:

- Collection and classification of information on ideas, designs, photographs, drawings and literature from different countries regarding technical aids for work, household and daily living. Furthermore ICTA deals with problems concerning transport, housing, architecture and outdoor facilities.
- Publication and distribution of this material
- Arranging and participating in conferences
- Acting as an information centre for institutions and individuals

ICTA
Information Centre

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Architectural Facilities for the Disabled



NEDERLANDSE VERENIGING VOOR REVALIDATIE (N.V.R.)
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Barriers...

FOREWORD

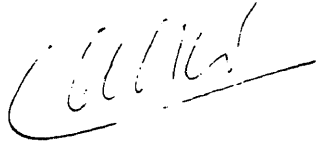
At present there seems to be a great need for more information concerning architectural facilities for the handicapped in order to facilitate integration. In every country there is a desire to help the handicapped person to meet his needs and much research and development is required in order to reach this goal. Furthermore each separate country usually does not have resources enough to undertake this work and therefore it is necessary to find ways of promoting international cooperation. In order to improve information and to avoid duplication of work the International Centre on Technical Aids, Housing and Transportation (ICTA), special body of Rehabilitation International, has initiated a close cooperation in this field with the Nederlandse Vereniging voor Revalidatie (NVR, the Netherlands Society for Rehabilitation).

The intention with the project "Architectural facilities" is to try to put together information on what has been and what is being done in various countries in this field and try to work out some directions for requirements enabling handicapped persons to function in society. We are, however, aware that there exist other publications with more exhaustive scientific studies of the requirements of physically handicapped persons. The reason why we have chosen this approach is that a publication like this is easy to handle and still contains the most essential data. In this publication we have concentrated on the requirements of physically handicapped persons and the basic data for freedom of movement can be obtained from the sketches containing information on dimensions of wheelchair and reaching zones of handicapped persons.

This booklet, which is part of the work performed so far by the Nederlandse Vereniging voor Revalidatie[1]) has been compiled from data derived from Dutch and other foreign sources and is to be regarded as a proposal for directions. Together with this booklet we intend to send a questionnaire to some relevant institutes/organizations in various countries in order to obtain their opinion and possible suggestions for amendments of the text and/or drawings, dimensions, etc. Our hope is that the National Secretaries in the countries affiliated or associated to Rehabilitation International can help us distribute the questionnaire and also help us obtain information on present research and development within this field. After that NVR in cooperation with ICTA will treat the material and viewpoints thus gained. It is possible that an international symposium on this subject could be arranged and that the result would be a revised edition of this booklet or a completely new publication.

This booklet is thus the first step in a project on architectural facilities initiated by ICTA and NVR. It is our sincere hope that this publication together with additional stages in the project will be of benefit to disabled persons throughout the world.

The Hague/Stockholm in May 1973



Dr. C. W. de Ruijter
President of NVR



Mr. Karl Montan
Director of ICTA

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INTRODUCTION

It is very important that in modern societies more attention should be paid to the accessibility and usability of buildings also for people with physical disabilities. Other marginal groups like people with heart diseases and rheumatic conditions, the aged and mothers with infants in prams or push-chairs also have special requirements of the same kind.

In addition of making all buildings and dwellings accessible and usable to a certain extent, it is important that sufficient number of dwellings, specially adapted to the needs of the disabled, should be built.

It is necessary to establish a set of technical principles to serve as the basis for creating accessibility and usability of buildings as well as adaptation of dwellings.

At the request of the Nederlandse Vereniging voor Revalidatie[1]) (NVR = Netherlands Society for Rehabilitation), whose staff have written the introductory text of this booklet, the necessary data for such a set of principles have been compiled by the architectural and structural engineering consultants' firm of Architecten- en Ingenieursbureau Ir. G. Gerritse N.V. Dordrecht, and are embodied in the drawings with their brief explanatory texts, which follow this introduction.

This work was undertaken in close cooperation with the Advisory Committee on Housing of the NVR. The criteria indicated in the drawings are those which are normally applicable to architectural and structural arrangements. For example, the wheelchair dimensions are chosen for chairs most frequently used for men; women's wheelchairs are a little smaller. Where possible, limiting dimensions have been given. If the actual arrangements provided are more generous than the minimum requirements, e.g. if stairs are made less steep, this is generally to be recommended.

Architectural obstacles

The following are some examples of the many architectural or constructional obstacles, which often constitute serious or even insurmountable barriers to disabled people and which can make a building inaccessible and/or unusable to them:

- absence of nearby parking space;
- high kerbs, steps and platforms or steep slopes;
- revolving doors or too narrow entrance doorways;
- too narrow corridors, room doors and lavatory doors;
- lavatory too cramped and therefore unsuitable for wheelchair users;

- lifts too small, with controls out of reach;
- obstacles located in what ought to be unobstructed space, (e.g., low-hanging awnings presenting a hazard to the blind);
- poor acoustics (people with defective hearing).

If a building, dwelling or recreation centre is to be really and fully accessible and usable, it will be necessary from the very outset to take account of a number of factors, which will be considered here, and it is desirable that these points be laid down in the schedule of requirements.

Classification of disabled people

With regard to buildings, dwellings and recreation centres it must be considered which category or categories of disabled people might want to reach the building in question, seek access and wish to use its facilities, and what requirements the special arrangements – particularly the sanitary equipment – will have to fulfil.

According to the nature and extent of the disability, the following distinctions can be made:

Group 1:
Ambulant disabled people, whose power of movement and locomotion are not, or not seriously, impaired and who can move about without external aids. They comprise:
- Persons with circulatory or locomotory defects or deficient functioning of the lungs (no high steps, etc.);
- Persons with prostheses and orthoses (artificial limbs and wearers of surgical braces);
- Persons wearing appliance for artificial openings from the intestinal or urinal system through the abdominal wall or with portable urine collecting device (special toilet facilities);
- Persons with impaired vision (markings, no obstacles);
- Persons with impaired hearing (acoustic hygiene).

Group 2:
Semi-ambulant disabled people (stick users), whose powers of locomotion are impaired to such an extent that they have to use external walking aids: sticks, elbow crutches, armpit crutches, tripods or wheeled frames.

People in this group are often unable, or not easily able to:
- stand by themselves;
- sit down;
- rise from the sitting posture.

In addition, the sphincter of the bladder may be paralysed.

Group 3:
Non-ambulant disabled people (wheelchair users), whose locomotion is so impaired that they are unable, or scarcely able, to walk and stand by themselves. They can move about in and around the building:

a. Independently:
- in a wheelchair propelled by means of hand-rims, if the person retains sufficient functional capacity in his arms;
- in an electric wheelchair if there is still only a little residual capacity;

b. With an attendant:
- seated in a special car chair or in an ordinary wheelchair.

Besides having the locomotory disability, wheelchair users may be affected by paralysis of the bladder sphincter.
In connection with the architectural and structural adaptation of dwellings it may be necessary to cater for cases where the disabled person is entirely, or almost entirely, bedridden.

Co-ordination of accessibility requirements
(physically disabled people)

It is very difficult to adjust the accessibility and service-ability of buildings to the requirements of each and every different form of physical disability. Since in general it is stick, crutch and wheelchair users who experience the greatest difficulties, buildings are designated as accessible and usable if they fulfil the requirements more particularly applicable to these groups of the disabled.

The criterion as to judging the accessibility and usability is that the disabled person must be able to enter the building and make use of its facilities without assistance or attendance. As regards wheelchair users it is presupposed that such persons are in possession of the normal functional use of their arms, but cannot use their legs.

Frequently the designer is faced with conflicting requirements. Thus, for a stick user a long but gentle slope may be more awkward than a staircase with a few steps. For people in wheelchairs, however, the ramp is essential if they shall have access to the building unaided. For this reason it is not unusual to provide a ramp beside a flight of steps leading up to the raised entrance of a building, since the majority of users will prefer the shorter distance offered by the steps.

Facilities for people with impaired hearing

Due consideration should be given to "acoustic hygiene" in the construction of buildings. This is something that is highly desirable even for people with normal hearing. For those, whose hearing is impaired and thus are much more prone to have difficulties of acoustic communication, it is essential to take appropriate structural-acoustic measures. Among other things the following points are of importance in this context:

a. Exclusion of disturbing noise, such as:
- traffic noise intruding from outside;
- sounds emitted by technical installations both inside and in the vicinity of the building;
- sounds of activities in adjoining rooms.

b. Providing the correct type and amount of sound-absorbing material, so that reverberation times are sufficiently cut down.
c. Avoiding strictly parallel surfaces and accurately square corners. In general, such arrangements will have to be sought in the vertical surfaces.

d. Good lighting to assist lip-reading.

e. Communal rooms should be provided with a so-called induction loop as a built-in feature to which microphones (for use by speakers), sound film and television equipment can be connected.
Provided that the special facilities are considered at an early stage in the design of the building, they generally need not be expensive. For this reason it is advisable to include "acoustic hygiene" in the schedule of requirements. As an example it is possible to avoid having recourse to expensive solutions by correct location of "acoustically sensitive" rooms in relation to potential sources of noise (traffic, technical installations, etc.)

Facilities for people with impaired vision

Among other things the following points are of importance to blind people and/or those with impaired vision:

a. Change of material at approaches to stairs, pedestrian crossings, etc.

b. Obviating as far as possible all obstacles protruding freely into space, e.g. low-hanging awnings over pavements, poles on a zebra crossing, etc.

c. Handrails at the top and bottom of stairs should continue horizontally for some distance (provided that they do not protrude into space).

d. Important pedestrian crossings to be provided with acoustic signals.

e. Edges of walking areas to be marked by borders, which can be felt by tapping with a stick (e.g. in places where the pavement kerb is sloped down to the roadway a difference in level of 2 cm should be retained at the edge of the kerb).

f. Contrasting colours to increase visibility, e.g. between door and door frame, between riser and tread on stairs, etc.

g. Name plates and number plates with embossed or recessed letters installed within reaching height.

Other arrangements

Besides the appropriate measures as to accessibility and usability of buildings, the importance of certain other measures must be pointed out such as the provision of special parking facilities for disabled people, location of a bus stop or other public transport stopping place near the building, installation of a specially adapted telephone booth inside or outside the building, etc.

General living amenity

It is worth noting that the arrangements provided will nearly always also enhance the overall "living amenity" for able-bodied persons as well. For instance, everyone will benefit by the removal of thresholds, good acoustics, contrasting colours and the absence of projecting nosings on stairs, etc. If lifts are installed for use by the disabled, they will also be to the benefit of other users. Furthermore cleaning is facilitated if the thresholds are removed.

Cost

If the schedule of requirements in question contains clear cut directives to the architect as regards accessibility and usability, these arrangements for buildings will in general involve little or no additional cost. Such cost, if any, is certainly negligible when expressed as a percentage of the total cost of construction. For dwellings specially adapted to the needs of disabled people, the cost situation may be rather different, however, since such adaptation sometimes necessitates increasing the available floor areas.

Dwellings (general)

The constructional features of dwellings for able-bodied people are also of major importance with regard to the possibilities for integration of the disabled into the life of the community. This is more particularly true of modern multi-storey residential buildings, which generally make it impossible for a wheelchair user to visit friends or relatives living in them, as e.g. lifts are too small or not provided at all, access doors are too stiffly hinged and thresholds are often very high.

In this field much remains to be done in order to ensure that new housing developments will indeed be accessible to all members of the community.

A good deal of research on these matters will be needed.
This will at the same time have to concentrate on the work of dimensioning and detailing such features as doors, thresholds and control equipment for technical installations (e.g. light switches, plug sockets, central heating controls) in such a way that these dwellings can, without substantial extra cost, be suitably visited and in many cases also used by people, who become temporarily or permanently disabled.

Dwellings adapted to the needs of the disabled

In the last twenty years more attention has been focused on the provision of residential accommodation specially adapted to the needs of physically disabled people. It comprises the adaptation of existing dwellings to the requirements of individual cases and also the construction of such residential accommodation "in advance", i.e., before it is known who will live in them.

Although the various forms of disability each impose different requirements upon the

dwelling, it is more particularly the dwellings for wheelchair users that call for special adaptive measures, such as wider doors and passages, more space in bathrooms, bedrooms, etc.

Dwellings for other categories of disabled people generally require only a limited number of special arrangements, e.g. good central heating for rheumatics, absence of thresholds for stick and crutch users, etc.

SUMMARY OF FACILITIES FOR THE DISABLED IN BUILDINGS

The categories of disabled people to be considered are the following:

1. persons with locomotory defects (including old people);
2. persons who can move about in a pushchair or a wheelchair;
3. blind persons and those with impaired vision;
4. deaf persons and those with impaired hearing.

These may be visitors as well as actual or future staff members.

Some points to watch:

I. Accessibility (external)

1. *Accessibility of the building:*
- The footway which is actually present or may be needed should be lowered to roadway level (maximum 2 cm difference); kerb to be bevelled (given a sloped edge) as an alternative possibility.
- Platforms, doorsteps, etc. should be made accessible.

2. *Parking of vehicles:*
- Sheltered place(s) for getting in and out.
- Parking area (330 cm × 500 cm) for disabled persons' cars, so located that the building can be reached by wheelchair on a level access way with close-textured surfacing, provided with a footway ascent ramp. (The size mentioned is for European cars)

II. Accessibility (internal)

1. *Entrance*
- If the entrance is not on street level, a ramp with 1:20 slope should be provided beside access steps. In exceptional cases a slope of up to 1:12 (maximum) is permissible.
At intervals of not more than 900 cm the ramp should be interrupted by horizontal areas which should, if possible, be 200 cm long and 130 cm wide. Minimum width for passing: 180 cm.
- Lift(s) in multi-storey buildings: sufficient width, lift access door easy to open (clear width not less than 80 cm), lift car of adequate dimensions (minimum: 110 cm wide × 140 cm deep). Controls in the right place and as low down as possible, to enable them to be operated by wheelchair users. Highest control button at not more than 150 cm height, preferably lower: 120 cm is ideal.

– If revolving doors, turnstiles or heavy doors to be opened by hand are used, a separate easy-to-open entrance door should be provided. Automatic door actuation is ideal.

2. *Entry doorways and corridors:*
– Wide doors, clear width preferably 90 cm, not less than 85 cm; no doors requiring heavy pushing to open.
– No thresholds; if thresholds are essential, then not more than 2 cm high.
– If used frequently by disabled people, walls and circulation ways should be provided with handrails at approximately 90 cm height.
– Handles on doors in lavatories, bathrooms, etc. should be approximately 90 cm above floor level.
– Corridors should be at least 180 cm wide to allow wheelchairs to pass one another.

3. *Important (average) dimensions of wheelchair in connection with manoeuvring space:*
– Turning circle: 150 cm minimum.
– Length: 120 cm minimum.
– Width: 70 cm.
– Clear space between floor and underside of tables: 77 cm minimum.

4. *Specially designed lavatory:*
– In each building at least one lavatory of adequate size and suitably equipped for wheelchair users. Sitting in the wheelchair, the user should be able to move into position in front of, and beside, the water closet. For a "universal" lavatory this requires dimensions of not less than 225 cm × 225 cm. Lavatory dimensions of 225 cm × 155 cm and 190 cm × 190 cm also offer possibilities, however. Height of water closet pan 10+ (= 50 cm) or 6+ (= 46 cm). Fitted with unbreakable seat. Supports which can be swung up out of the way when not required are very desirable features on both sides of the pan. In a 225 cm × 155 cm lavatory there should be a fixed support on the adjacent wall and a swing-up support on the free side of the closet. If possible, a contrivance for pulling oneself up (triangle) should be provided above the closet.

5. *Vertical transport:*
– The lift is to be preferred (see section 11.1)
– If stairs are inevitable, they should be easy straight staircases with wide steps for persons with locomotory disabilities; tread at least 32 cm, riser not more than 14 cm; no nosings on the steps.
– Strong, properly graspable handrail(s) along stairs; wide staircases should have central balustrade. Handrails should continue for about 45 cm at top and bottom, provided they do not thus stick out.
– No so-called open staircases.

III. Usability (among others, the following facilities and arrangements should be provided)

1. *Physically handicapped persons:*
– Ticket-windows, counters and writing desks at two different heights, i.e., some at normal height and some at wheelchair height (underside of table top 77 cm from floor).

– In post offices, banks, etc. an (outside) counter at a height as mentioned in the preceding point should be provided, so located that the disabled person can transact his business while sitting in his wheelchair or his motor car.
Sufficient space between counters and barriers (in front of ticket-windows, etc.) and also at exits (stations, sports grounds, etc.), i.e., a clear width of passage of preferably 85 to 90 cm.
– In restaurants, libraries and suchlike buildings: dining tables and reading tables of the right dimensions for a wheelchair user to be able to sit at them. Clear space under table: 77 cm.
– In theatres, cinemas, etc.: provide space for wheelchair users and parking space for wheelchairs for those who can leave their wheelchairs and occupy ordinary seats.
– In shops, at ticket-windows, counters, etc., seats (possibly of the tip-up type) should be provided for persons unable to stand for long periods.
– Switches, wall plug-in sockets, as well as bell pushbuttons, alarm devices, telephones, etc., should be installed at a height of about 100 cm above floor level. Table-top appliances are preferable. Dimensions of telephone booth preferably 120 cm × 200 cm; not less than 110 cm × 140 cm.
– Good types of floor covering: even and lying firmly, non-skid.
– Clear signposting to special facilities for the disabled is desirable.

2. *Persons with impaired vision:*
– Changes in texture of materials at danger spots (for blind people).
– Contrasting colours at danger spots (for those with deficient vision).

3. *Persons with impaired hearing:*
– So-called induction loop comprising a built-in circuit, preferably with plug-in connections for headphones (for spoken communications and for radio and television programmes).
– Use of sufficient acoustic (sound-absorbing) material in connection with use of hearing aids.

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Olten

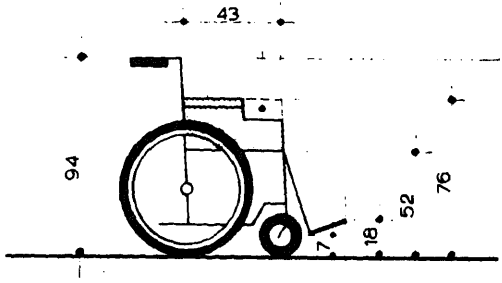
S.A.E.B.
Bautechnische Forderungen behinderter Menschen
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the wheelchair

principal dimensions of the ordinary hand-propelled wheelchair

1.1.1.

side elevation



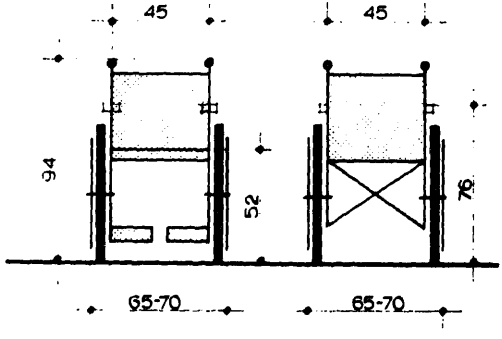
possibly: stepped and reversible armrest

hand-rim for propelling the chair

foot-rest with adjustable height

left: *front elevation*

right: *rear elevation*

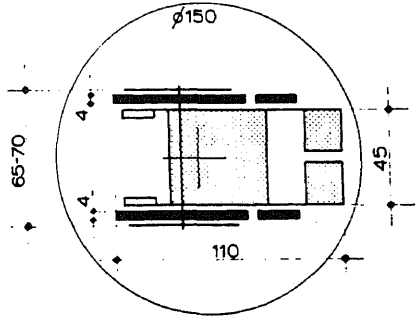


note: there are several models of wheelchairs, including some with swivelling wheels at the rear; these models are usually shorter

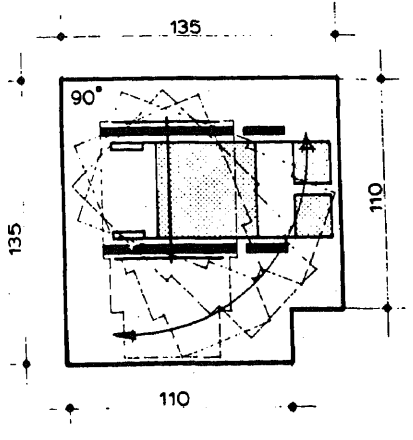
the space occupied by the chair and required for manipulating it can, for the various models, be based on these diagrams

most electrically propelled wheelchairs are about 70 cm wide and about 110 cm long

1.1.2.



minimum turning circle 150 cm ø



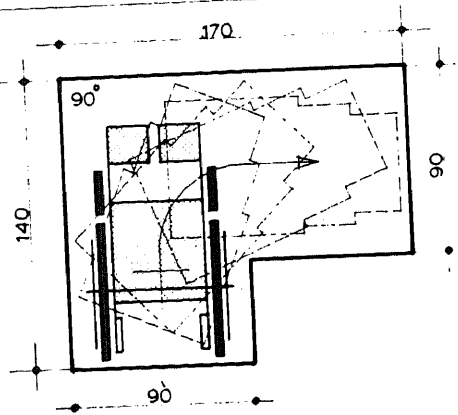
minimum space needed for a 90° turn

for manoeuvring space in working rooms see 1.1.3.

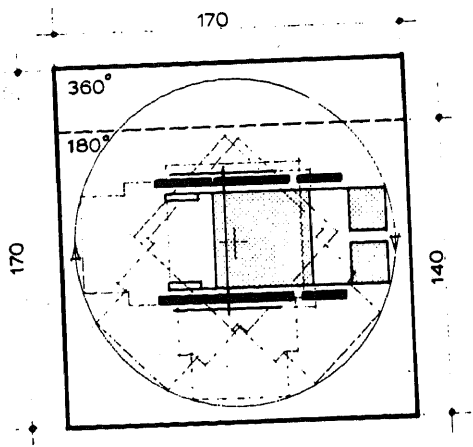
NVR

the wheelchair
minimum manoeuvring space in working rooms

1.1.3.



minimum space needed for negotiating a 90° bend



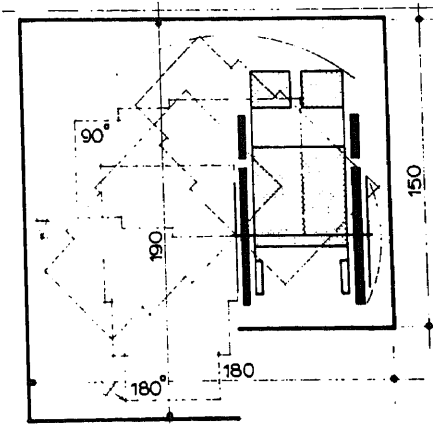
minimum space needed for a 180° turn around one wheel as the fixed pivoting point

NVR

the wheelchair

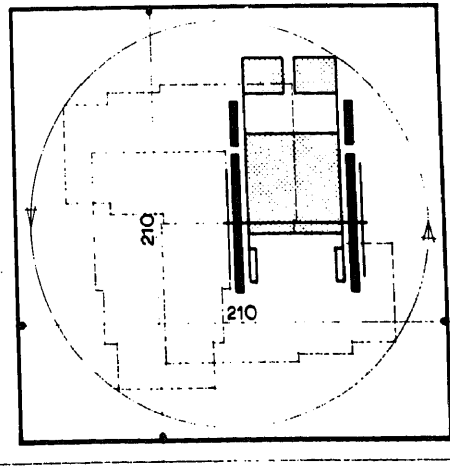
minimum manoeuvring space for electric wheelchairs

1.1.4.



90° turn
minimum space
150 x 180 cm

180° turn
180 x 190 cm



360° turn
210 x 210 cm

n.b.
turning around one wheel as the fixed pivoting point

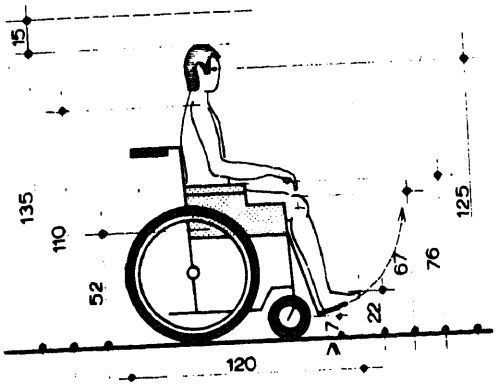
NVR

the disabled person

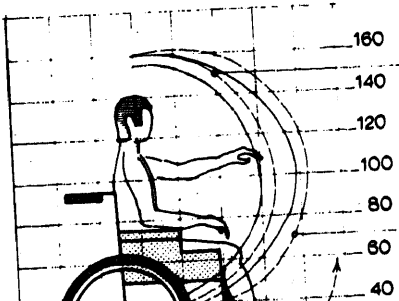
the disabled person in the wheelchair
principal average dimensions

1.2.1.

side elevation



side elevation

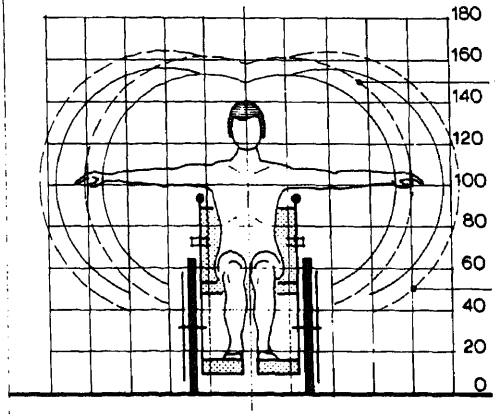


the disabled person

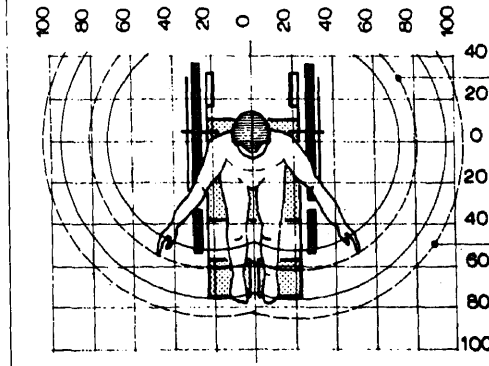
the disabled person in the wheelchair
reaching zones

1.2.2.

front elevation



plan view

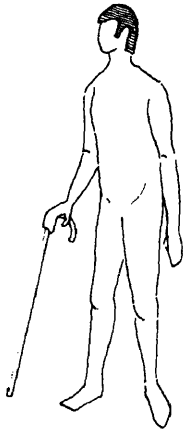


NVR

the disabled person

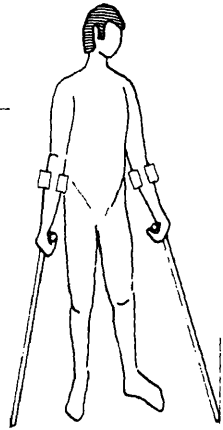
the disabled person using a stick or crutches
space for movement

1.2.3.



stick user

± 70



crutch user

± 90

note:
no loose carpets
or mats

no grating apertures
of more than 2 cm

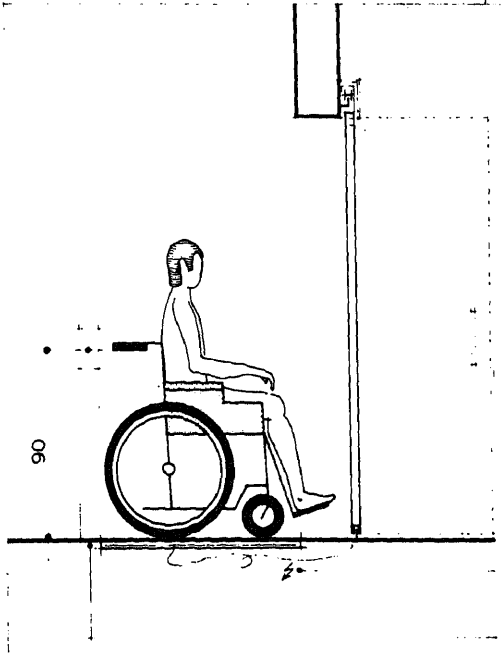
no highly polished
floors

NVR

accessibility

automatically-opening sliding and pivoted doors

2.1.1



sliding door with automatic action (pivoted door dotted)

clear width minimum 85 cm (= door width 90 cm)

where pivoted doors are used, these should, wherever possible, swing away from the direction of approach

level floor without floor rails

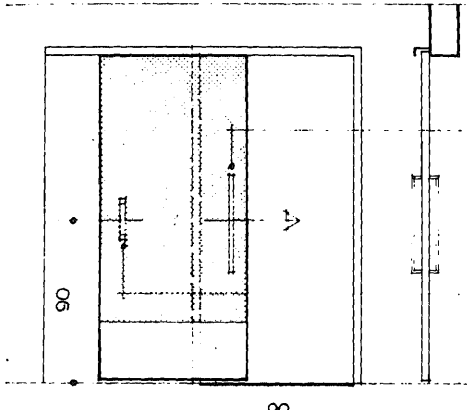
electrical contact under rubber floormat or electric eye or column with button at sufficient distance of door

no coconut doormats should be used because they impede locomotion and slip easily

NVR

accessibility
sliding and pivoted doors

2.1.2.



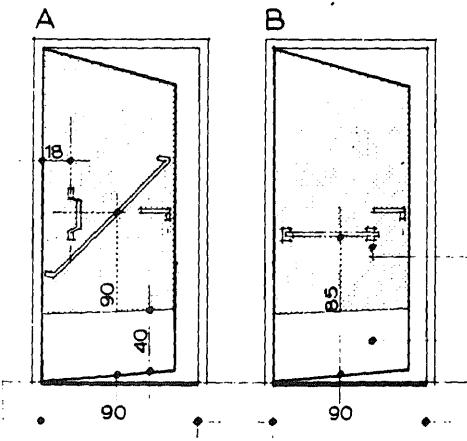
sliding door
of non warping material
with mountings for
smooth easy movement

large and firm handle

extra handle for
closing the door

level continuous floor

clear width minimum
85 cm (= door width
90 cm)



pivoted door

frame in contrasting
colours for persons with
poor vision

impact-resisting frame
to withstand mechanical
damage, up to 100 cm

two possibilities for
handles

protective strip for
knocks and scratches

clear width minimum
85 cm (= door width
90 cm)

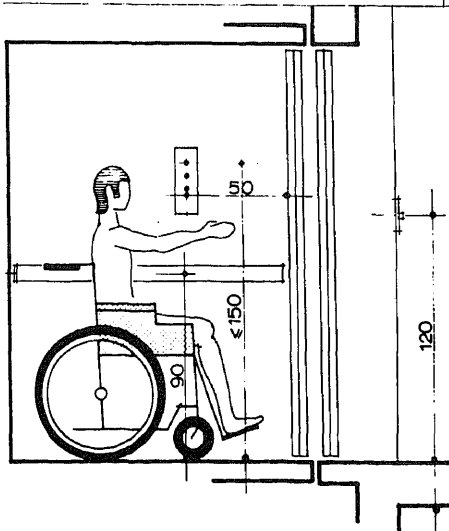
make provisions for
fixing handles when
doors are hollow

NVR

accessibility

lifts

2.1.5.1



lift: minimum dimensions for wheelchair with attendant 110 x 140 cm, automatic sliding door

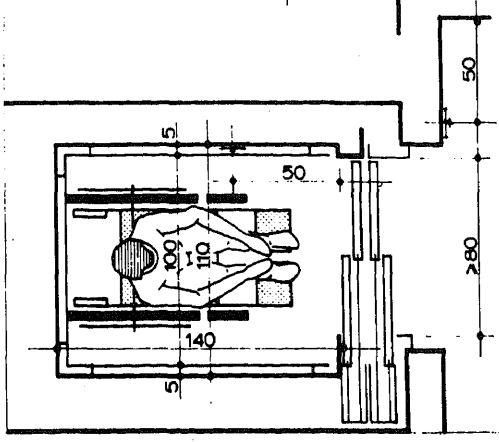
correct position for control panel

handrail at 90 cm on three sides

alarm signal device 100 cm above floor, preferably telephone

gap between lift car and floor max. 2 cm

accuracy of stopping max. 2½ cm



button

inside dimensions: 110 x 140 cm
dimensions between handrail and wall of lift car = 5 cm

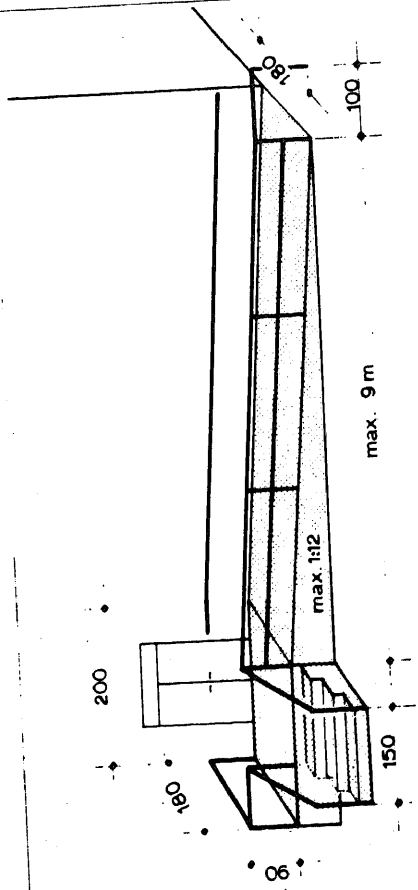
dimensions between railings = 100 cm

n.b.
for nursing homes etc. special large buttons possibly in horizontal arrangement

NVR

accessibility
ramps for buildings

2.1.6.1.



person in wheelchair can travel on ramp independently and without using handrail

handrail on both sides of ramp

width: 180 cm for passing. If not necessary total width 130 cm

long ramps should be provided with intermediate landings at least every 900 cm

length of landing 200 cm minimum 150 cm

if available space permits: slope of ramp preferably 1 in 20 to 1 in 15 maximum: 1 in 12

for ramps steeper than 1 in 20 (5%): indicate percentage of slope

ramp should be completely horizontal in transverse direction

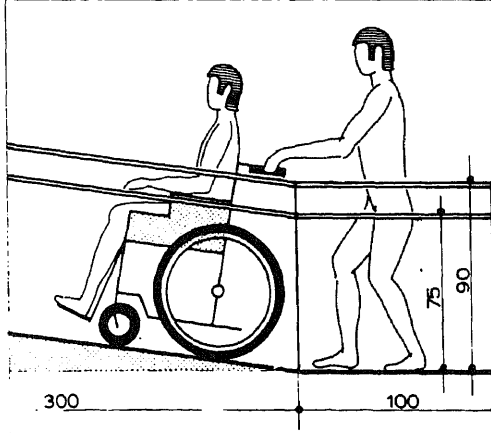
section see 2.1.6.2.

also provide normal access steps, these can often also be used by persons using a stick see 2.1.8.

NVR

accessibility
ramps for private use

2.1.6.



slope maximum 1 in 8 at length of maximum 300 cm if longer intermediate landings are necessary

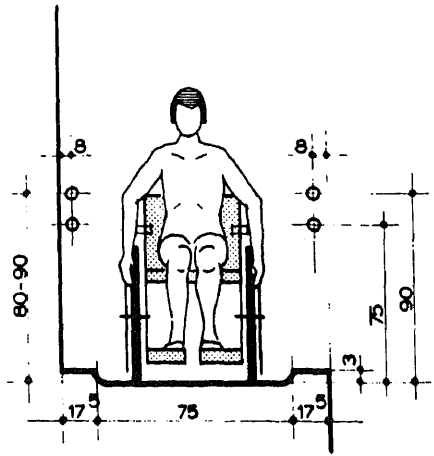
for considerable differences in height use lifting platforms

width of ramp: 85-95 cm

normal handrail at 90 cm height for non-disabled persons and stick users

extra handrail for independently ascending the ramp: to be used on slopes steeper than 1 in 12

for persons using a stick it is necessary also to provide steps



a handrail height of 80-90 cm is recommended

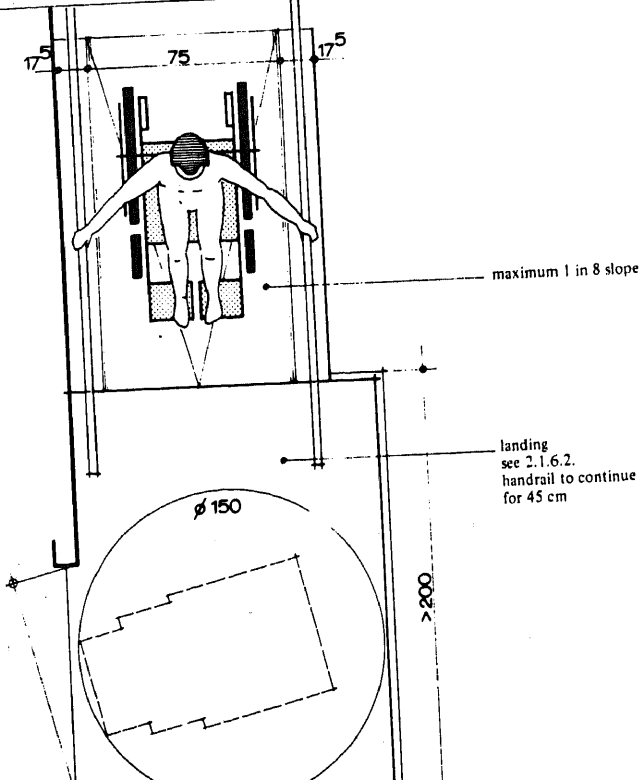
if it is necessary to use a higher handrail, it is advisable to install a second handrail at 75 cm. This handrail is needed for use without help at gradients steeper than 1 in 12

NVR

accessibility

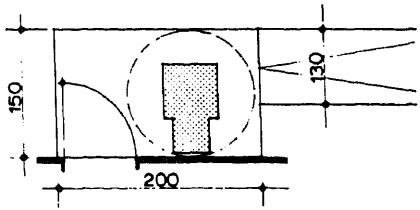
landings on ramps
manoeuvring space for landing for **private use**

2.1.7.1.

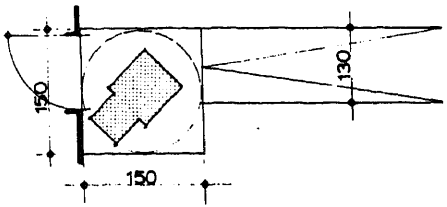


accessibility
landings on ramps
manoeuvring space for landing for general use

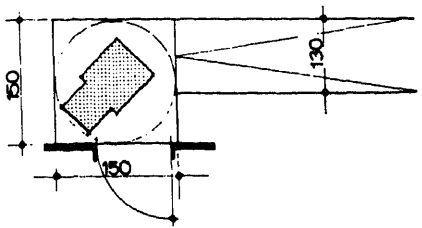
2.1.7.2.



landing of sufficient size to enable wheel-chair to be manoeuvred



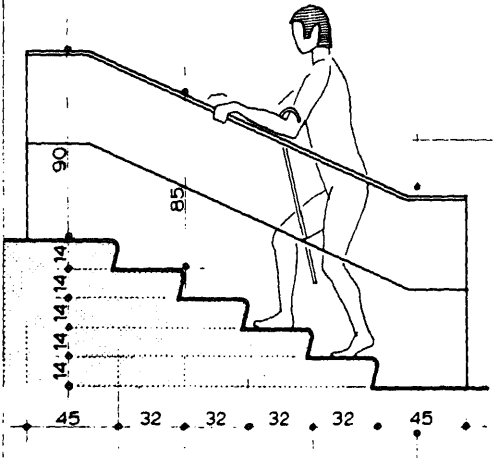
steps should also be provided, in addition to ramp



intermediate landings to be provided on ramps more than 900 cm in length

accessibility
staircases

2.1.8.



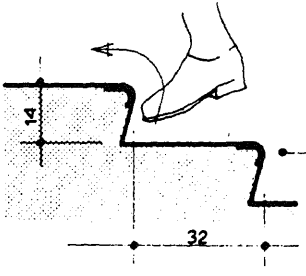
handrail to be securely fixed because of abnormal load acting in different direction

width of stairs:
if possibility of passing is required: 120 cm
for leaning on two handrails: 90 cm

riser:
recommended 14 cm
minimum 8 cm

tread:
recommended 32 cm

handrail to continue beyond upper and lower end of stairs: this does not apply to landings when protruding freely into space

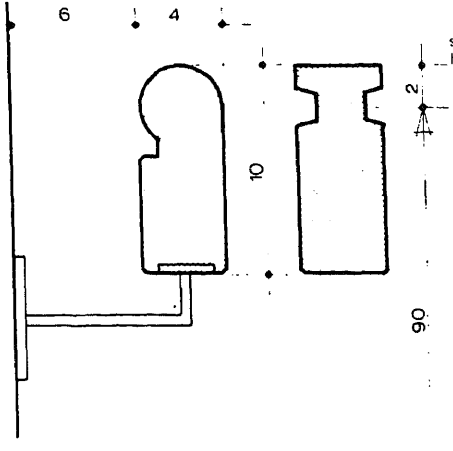


anti-slip strip

riser and tread in contrasting colours

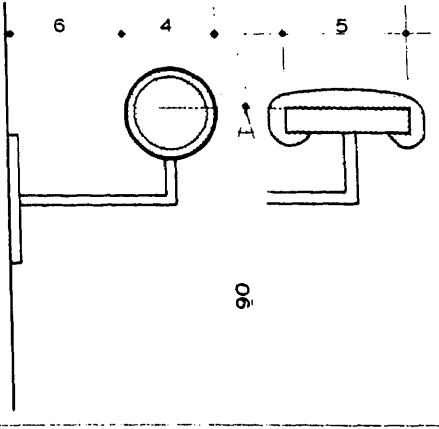
for blind persons:
different floor material on approach to stairs over a length of 120 cm

NVR



sections for wooden handrails

hand should be able to enclose rail properly: sharp edges should be rounded

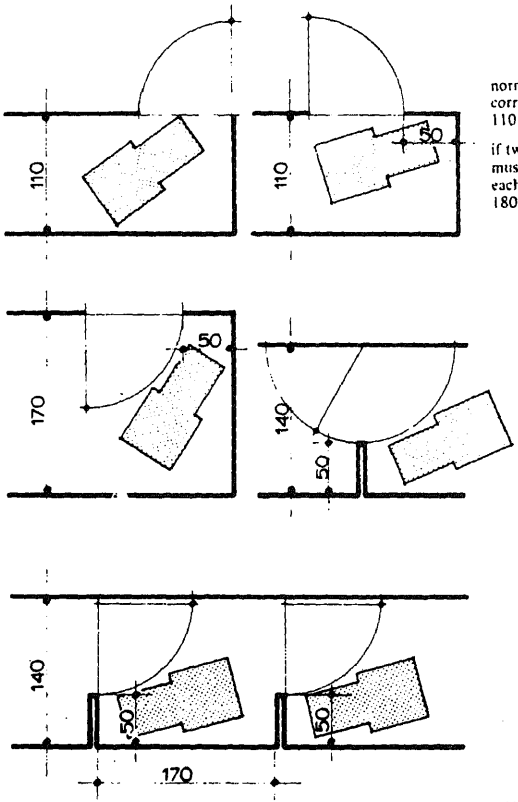


sections for metal handrails

handrails to be covered with plastic

accessibility
location of doors in passages and entrances

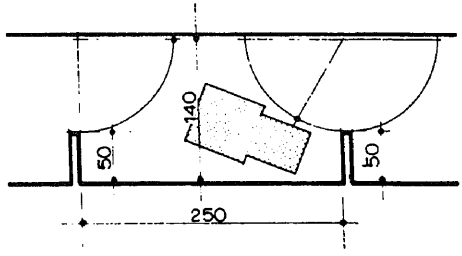
2.1.10.1

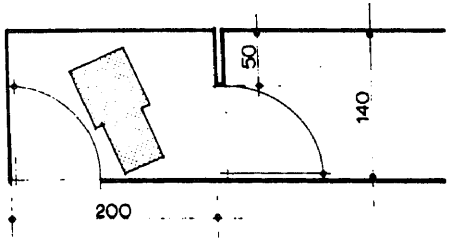


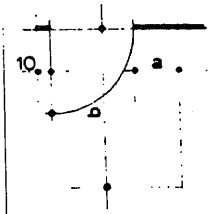
normal width of corridor:
110 cm

if two wheelchairs must be able to pass each other:
180 cm

see also 2.1.10.2.







a	b
25	170
35	160
45	150
55	140

manoeuvring space in front of a door

intermediate dimensions should be interpolated

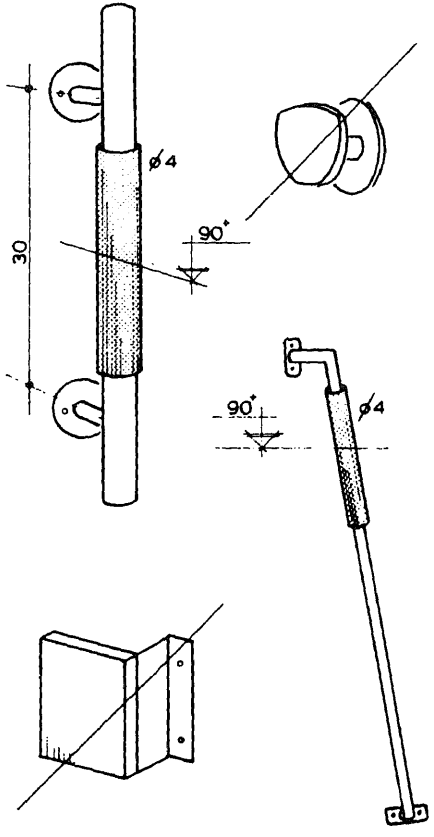
see also 2.1.10.1.

NVR

utility

hinges and locks
handles for frontdoors

2.2.5.1

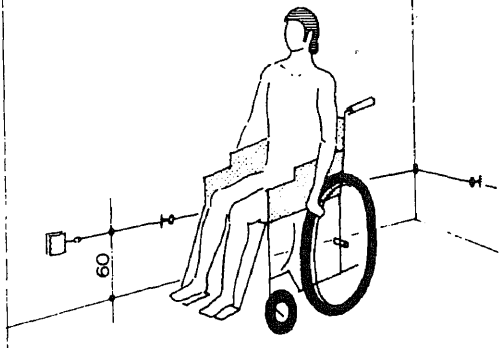


hand should be able to enclose handles and knobs easily

utility

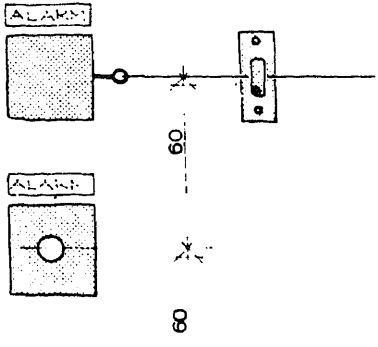
alarm installation for use in lavatories, shower rooms etc.

2.2.6.



alarm installation: pull switch connected with orange or red cord extending all round the room at height of 60 cm

alternative: easily reachable push-button



pull switch with cord

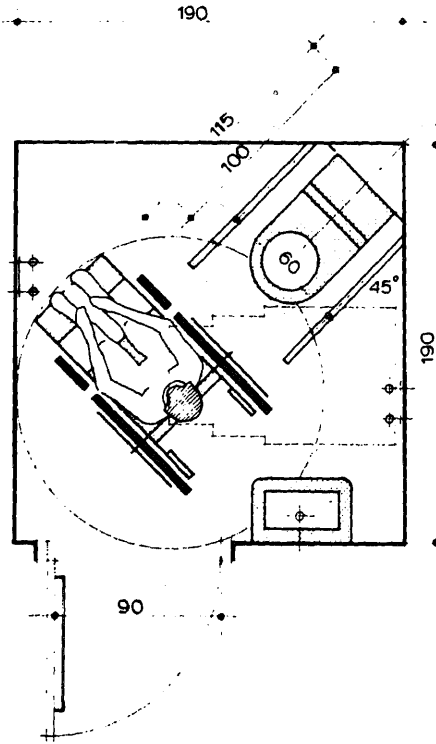
push-button: should be reachable even when lying on the floor

NVR

buildings

lavatory minimum size 190 x 190 cm

3.1.1.1.



acceptable plan for a lavatory where limited space is available

for universal lavatory see 3.1.1.3.

siphonic closet see 3.1.1.4.

swing-up double arm rests see 3.1.1.5.

hooks for clothing at 120 cm height

wash basin, size 30 x 50 cm with bracket and mirror

lock: opening from outside should be possible

alarm installation see 2.2.6.

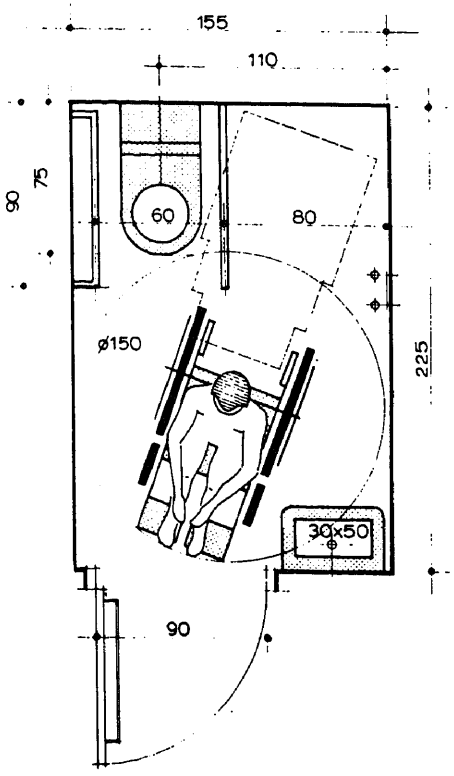
n.b.
waste bin should be available

also a sliding door can be recommended

buildings

lavatory minimum size 225 x 155 cm

3.1.1.2.



acceptable plan for a lavatory where limited space is available

for universal lavatory see 3.1.1.3.

siphonic closet see 3.1.1.4.

swing-up arm rest, slanting bar fixed to wall

hooks for clothing at 120 cm height

wash basin, size 30 x 50 cm with bracket and mirror

lock: opening from outside should be possible

alarm installation see 2.2.6.

n.b.
waste bin should be available

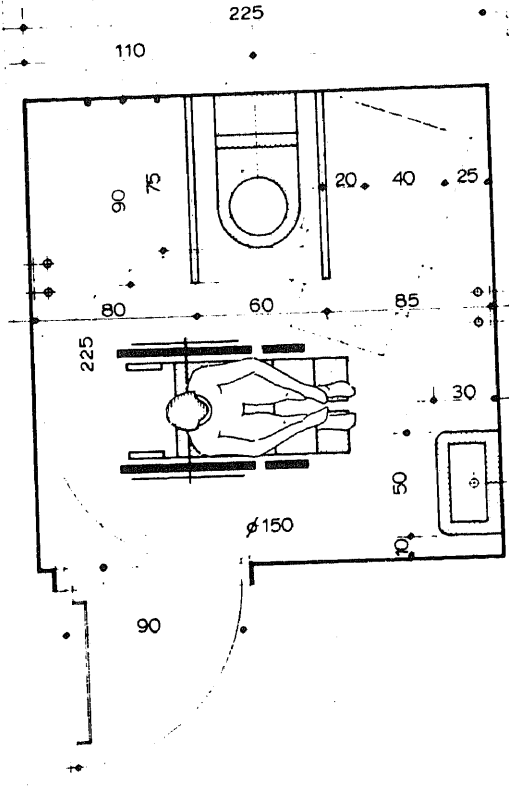
also a sliding door can be recommended

NVR

buildings

universal
lavatory minimum size 225 x 225 cm

3.1.1.3.



universal plan which allows for space for assistance by helper

siphonic closet see 3.1.1.4.

swing-up double arm rests, see 3.1.1.5.

hooks for clothing at 120 cm height

wash basin, size 30 x 50 cm with bracket and mirror

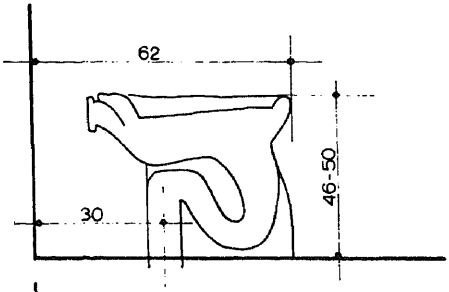
lock: opening from outside should be possible

alarm installation see 2.2.6.

n.b.
waste bin should be available

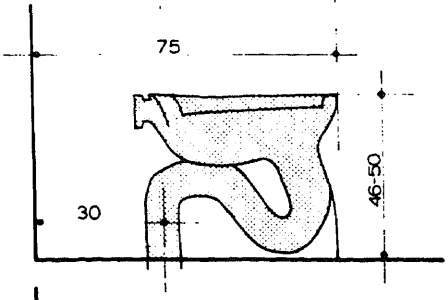
also a sliding door can be recommended

NVR



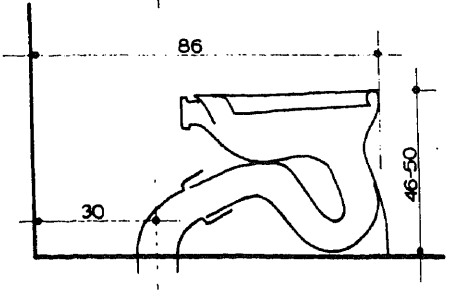
when discharge pipe is placed 30 cm from wall, a normal as well as an adapted siphonic pan can be installed

height of closet 46 to 50 cm



for general use in lavatories this pan, mounted 75 cm from the wall, is preferred

seat: use an unbreakable seat



cistern: a low-level cistern with lever or button may be used or an ordinary high-level flushing cistern with pull cord

n.b.
for individual use, adaptation to handicap can be necessary

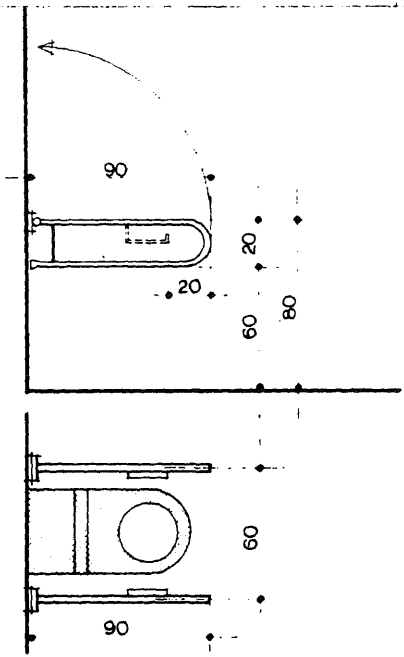
NVR

buildings

lavatories

swing-up double arm rests

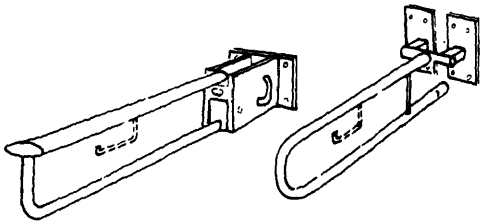
3.1.1.5.



examples of arm rests, with and without hook for toilet roll

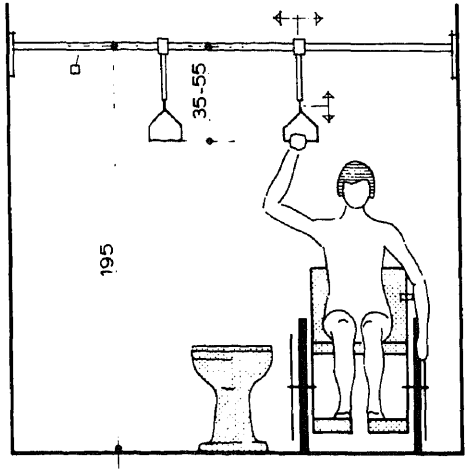
for special cases arm rests can be used combined with back rest

wall sufficiently thick and firm to withstand a heavy load



left: arm rest can be fixed in vertical position

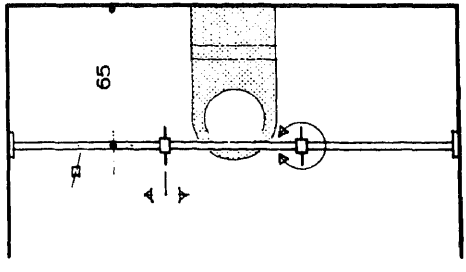
right: arm rest, when in vertical position, is held by a magnet



triangles: square steel bar with two sliding small bars with hand grip in triangle form

grip can be raised and lowered

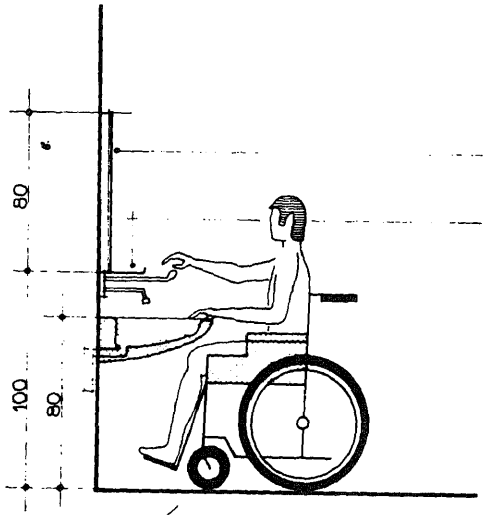
by pulling, handicapped person can move over onto lavatory



n.b.
a triangle is preferred to swing-up arm rests by some handicapped people because pulling needs less effort than pushing oneself up

triangles to be used in individual cases or as an extra fitting in buildings where many handicapped people use the adapted lavatory

NVR



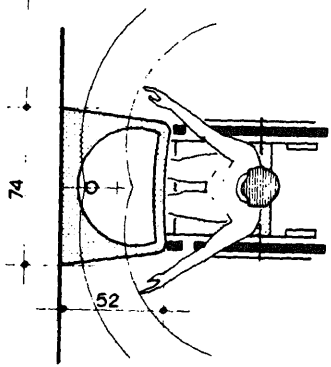
inclined mirror,
125 cm height to centre,
or straight mirror
100-180 cm

fixture for disposal
of bandages etc.

mixing tap with lever
control, thermostatic-
ally safeguarded

wash-basin for wheel-
chair users, fixed very
firmly, as some people
will lean on it

discharge pipe at rear
or as close as possible
to wall and off-centre



special wash-basin,
hollow at front

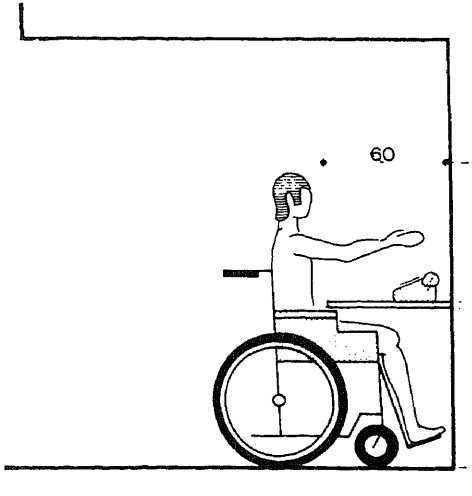
depending on available
space, smaller basins
can be used

n.b.
waste bin near basin
with opening at approx.
80 cm

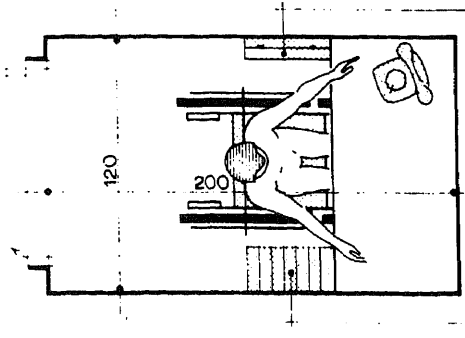
attention to correct
height of towels etc.
grasping height approx.
100 cm

building
telephone booth

3.1.2.1



telephone booth: door should be easily opened. No heavy springs



tip-up seat, height 50 cm

minimum size can be 110 x 140 cm

for special cases telephones with sound box are available

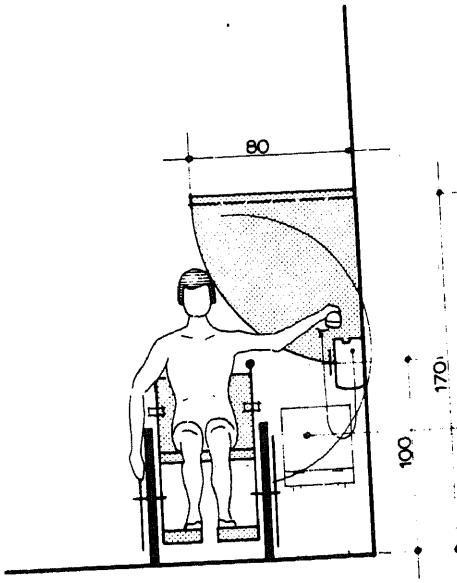
official telephone guides

NVR

buildings
telephone hood

3.1.2.2.

telephone
can be used seated

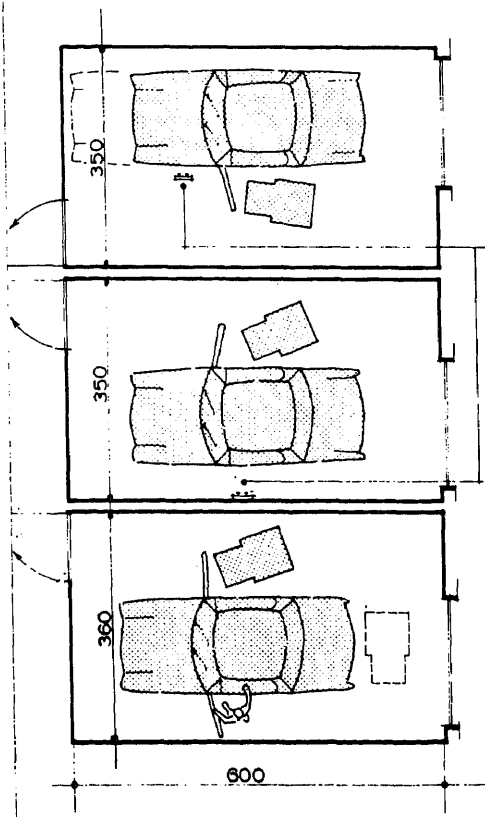


dial and coin box at approx. 100 cm

tip-up seat, height 50 cm

buildings
garages (for car length up to 400 cm)

3.2.10.



garage for wheelchair user who drives car wheelchair remains in garage (*a*)

approx. 300 cm in front of garage: post with electric door-opener, height approx. 100 cm

pendant controls for light and electrically operated tilting door

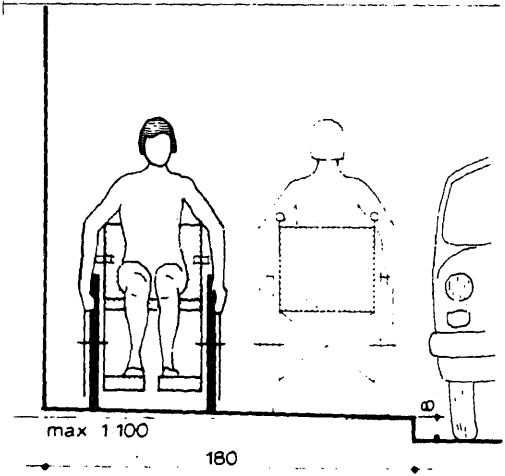
garage for wheelchair user who drives car wheelchair taken in the car (*b*)

garage for wheelchair user who is passenger in car
space required for manipulating wheel-chair to put it in the car boot (*c*)

general: if possible, direct access from building or house

attention to space and loading equipment for electric wheelchair 16 Amp., when required

NVR



pavement
(footway)

minimum width:
120 cm if local extra width for passing is provided

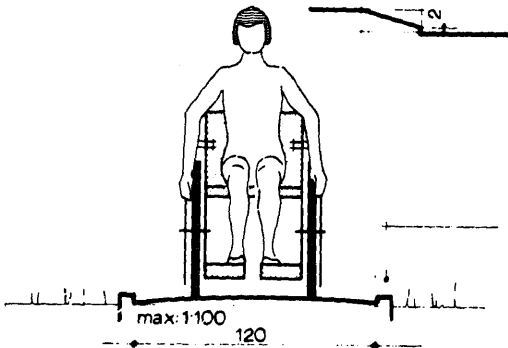
recommended width
180 cm

longitudinal gradient:
not steeper than 1 in 20

maximum cross-fall:
1 in 100

kerb preferably not higher than 8 cm

locally lowered kerb (rounded, 2 cm high) in places where wheelchair has to leave the pavement



footpath

material: preferably paving with closed-texture surface

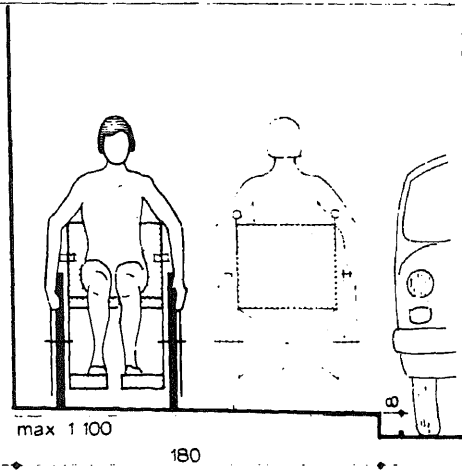
minimum width: 120 cm if local extra width for passing is provided
recommended width:
180 cm
maximum longitudinal gradient: 1 in 20

distinct separation of path from border

maximum cross-fall:
1 in 100
n.b.
pavement and footpath: on long gradients hori-

town planning arrangements
pavement, footpaths

4.1.1.



pavement (footway)

minimum width: 120 cm if local extra width for passing is provided

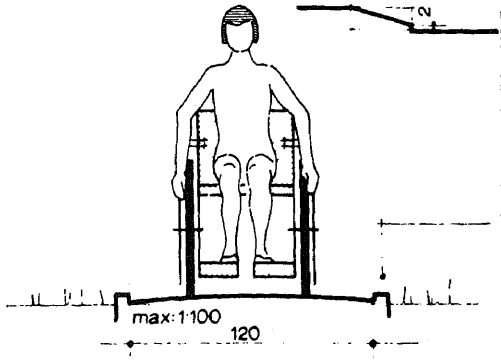
recommended width: 180 cm

longitudinal gradient: not steeper than 1 in 20

maximum cross-fall: 1 in 100

kerb preferably not higher than 8 cm

locally lowered kerb (rounded, 2 cm high) in places where wheelchair has to leave the pavement



footpath

material: preferably paving with closed-texture surface

minimum width: 120 cm if local extra width for passing is provided
recommended width: 180 cm
maximum longitudinal gradient: 1 in 20

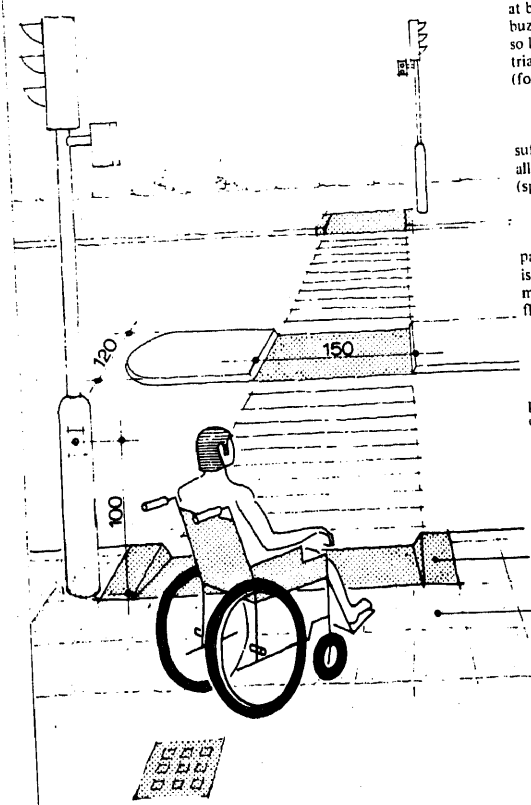
distinct separation of path from border

maximum cross-fall: 1 in 100
n.b.
pavement and footpath: on long gradients horizontal rest areas ('landings') should be provided.

NVR

town planning arrangements
pavements, pedestrian crossings

4.1.2.



pedestrian crossing

at busy crossings a buzzer should sound so long as the pedestrians' light is at 'safe' (for blind persons)

sufficient time to allow safe crossing (speed 1 m/5 sec.)

passage through traffic island should be 150 cm minimum width and flush with roadway

push-button in contrasting colour

concrete ramp. 90 cm min. width

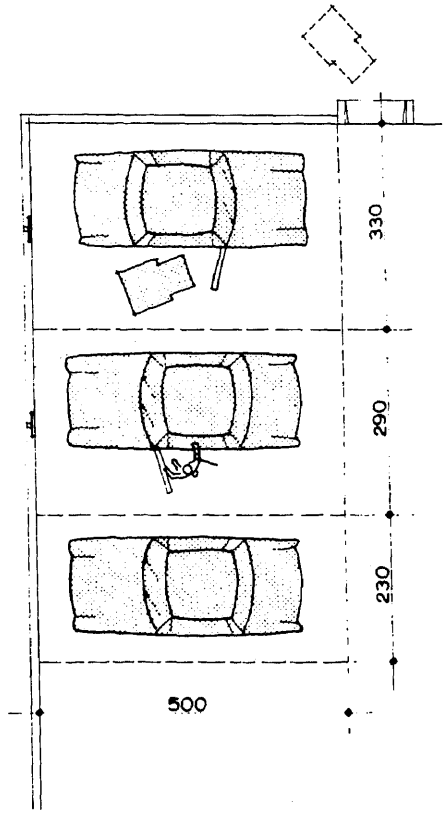
different paving material to warn blind and semi-blind persons; may also extend across full width of pavement

grid openings max. 2 cm for stick users

NVR

town planning arrangements
car parks (dimensions apply to European cars)

4.1.3.



pavement (footway) with locally lowered kerb

notice board: 'no parking except for invalids'

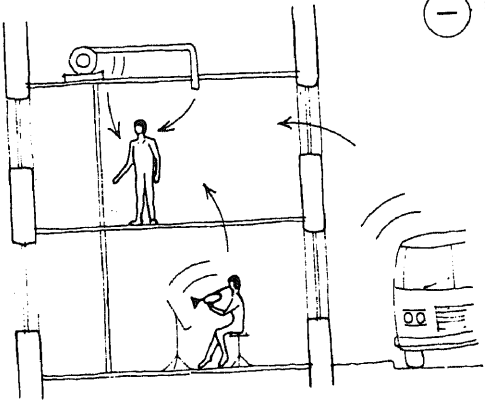
parking bay for stick users

ordinary parking bay

NVR

persons with sensory disabilities
persons with impaired hearing

5.1.1.

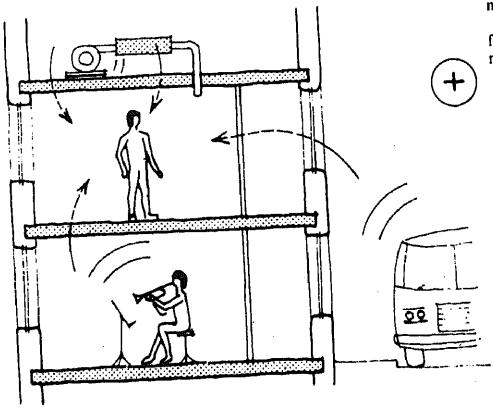


forms of noise nuisance

fan

traffic noise

various methods of combating noise nuisance



fan should be resiliently mounted with silencer

heavy solid floors

corridor protects

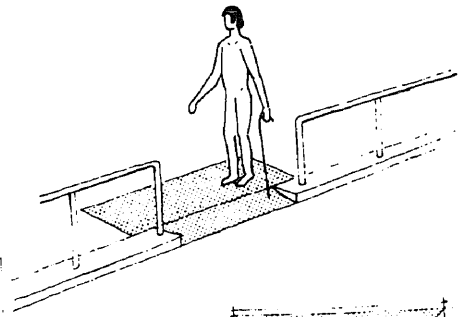
n.b.
good acoustics is desirable for a person with normal hearing; for a person with impaired hearing it is indispensable

good lighting is necessary in connection with lip-reading.

NVR

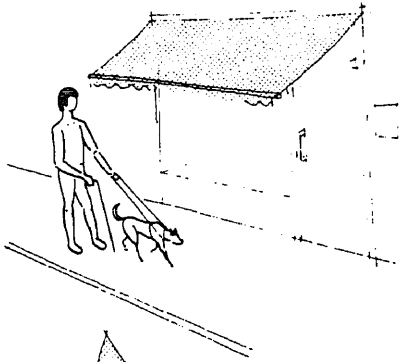
persons with sensory disabilities
persons with impaired vision

5.1.2.



safety barrier with conspicuous distinctive colour

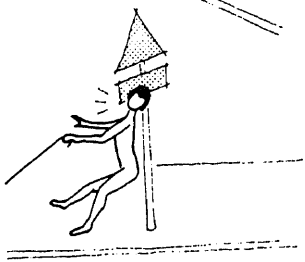
different paving material at pedestrian crossing, see 4.1.2.



no protruding obstacles lower than 200 cm

name-plate with embossed lettering installed within reach

door frame in contrasting colour



road signs should be installed at safe height

posts in conspicuous colours, preferably yellow/black

n.b.
where necessary, the arrangements for visually handicapped persons should be incorporated in the drawings

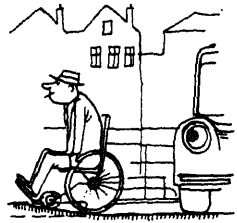
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The handicapped wants to participate in social life as independently as possible. Do not make him unnecessarily dependent. Offer him accessibility as well in the home as in public buildings.

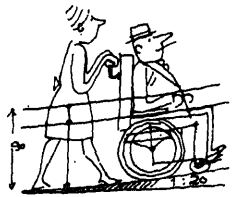
Also pay attention to possibilities for his recreation and holidays.

IN THIS WAY ARCHITECTURAL OBSTACLES CAN BE PREVENTED

That is less difficult than you think. Timely attention to the problem is important. Then extra costs need not, or hardly not, be incurred.



SEE THAT THERE ARE SPECIAL PARKING PLACES WITH A LOCALLY LOWERED KERB

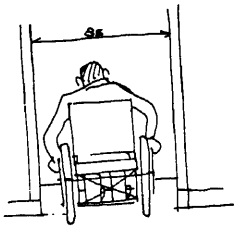


WHERE THERE IS A DIFFERENCE IN HEIGHT, A GRADUAL SLOPE, PREFERABLY 1 IN 20, SOLVES THE PROBLEM





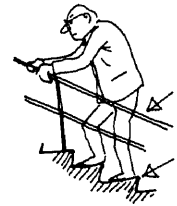




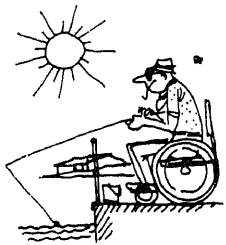
ALLOW DOORS A FREE PASSAGE OF 85 OR 90cm AUTOMATIC SLIDING DOORS ARE IDEAL



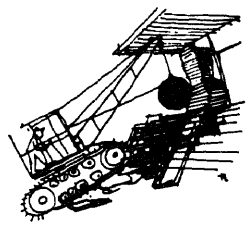
MAKE LIFTS AT LEAST 110X140CM. MAXIMUM HEIGHT OF LIFT BUTTON 150CM, PREFERABLY 120CM



FOR AMBULANT HANDICAPPED TREADS WITHOUT PROJECTIONS FIRM HANDRAILS.



TACKLE RECREATION FACILITIES, TOO



ADAPTATION AT A LATER STAGE IS MOSTLY VERY EXPENSIVE!

NEDERLANDSE VERENIGING VOOR REVALIDATIE (N.V.R.)

(The Netherlands Society for Rehabilitation)

national organization for co-operation in the field of rehabilitation and the welfare of the handicapped

The activities of the society include

- health care
- education and training
- worthwhile work and/or occupation
- furtherance of the integration of the handicapped
- adapted housing (individual and communal)
- increase of social security
- recreation
- accessibility and adaption of buildings
- distribution of the international accessibility symbol



Distribution by ICTA
Price: $ 2.—



ISRD International Society for Rehabilitation of the Disabled (Rehabilitation International)
ICTA ISRD Committee on Technical Aids, Housing and Transportation
NVR The Netherlands Society for Rehabilitation

and other documents and publications which were available from a variety of sources in the period from 1971 - 1975.

The listing is by no means definitive, but it does give sources for reference and future research on this particular subject.

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particularly helpful or of assistance during the course of this study.

In some cases the organizations which the people represent are less important than are the people in gaining information or material, which is why their name is listed here. In other cases, the organization itself is committed to the extent that a particular person involved in the organization is of lesser importance, so the agency is listed in the next section rather than the name of a specific individual in this particular indexing.

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esearch Council
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Arthritis and Rheumatism Society
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of Michigan
The Design of Public Outdoor Recreation
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American Association for Health, Physical Education and Recreation
1201 - 36th Street, N.W.
Washington, D.C. 20036

American Association for Rehabilitation Therapy
P. O. Box 93
North Little Rock, Arkansas 72116

American Association of Retired Persons/
National Retired Teachers Association
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American Association of Workers for the Blind, Inc
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1511 K Street, N. W.
Washington, D. C. 20005

American Association on Mental Deficiency
George Sologanis, Executive Secretary
5201 Washington Avenue, N.W.
Washington, D. C. 20015

American Cancer Society, Inc.
521 West 37th Street
New York, New York

American Congress of Rehabilitation Medicine
30 Noarth Michigan Avenue
Chicago, Illinois 60602

American Corrective Therapy Association
Robert W. Crist
25 Barnes Court
Hampton, Virginia 22364

American Diabetes Association, Inc.
1 East 45th Street
New York, New York

American Foundation for the Blind, Inc.
15 West 16th Street
New York, New York 10011

American Hearing Society
919 - 18th Street, N.W.
Washington, D.C.

840 North Lake Shore Drive
Chicago, Illinois

American Institute of Architects
Edward H. Noakes & Associates - Archit
7315 Wisconsin Avenue, N.W.
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American Leprosy Missions, Inc.
297 Park Avenue, South
New York, New York 10010

American Medical Association
535 North Dearborn Street
Chicago, Illinois

American Occupational Therapy Associa
6000 Executive Boulevard
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American Organization for Rehabilitati
Training Federation
871 Broadway
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American Orthotics and Prosthetics Asso
1440 N Street, N.W.
Washington, D. C. 20005

American National Red Cross
17th and D Streets, N.W.
Washington, D.C. 20006

American Osteopathic Association
212 East Ohio Street
Chicago, Illinois

American Physical Therapy Association
Royce P. Noland, Executive Director
1156 - 15th Street, N.W.
Washington, D.C. 20005

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20 Chevy Chase Circle
Washington, D.C. 20015

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1700 - 18th Street, N.W.
Washington, D. C. 20009

American Public Health Association

New York, New York 10010

American Speech and Hearing Association
9030 Old Georgetown Road
Washington, D.C. 20014

AMVETS (American Veterans of WWII, Korea, and Vietnam)
1710 Rhode Island Avenue, N.W.
Washington, D.C. 20036

Arthritis and Rheumatism Foundation
Ten Columbus Circle
New York, New York

American Rehabilitation Foundation
1800 Chicago Avenue
Minneapolis, Minnesota 55404

Arthritis Foundation
1212 Avenue of the Americas
New York, New York 10036

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5225 Grace Street
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Blinded Veterans Association
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New Brunswick, New Jersey 08902

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U.S. Office of Education
400 Maryland Avenue, S.W.
Washington, D.C. 20202

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1920 Association Drive
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Council of Organizations Serving the Deaf
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Columbia, Maryland 23044

Council of State Administrators of Vocational Rehabilitation

New York, New York 10017

EPI-HAB, L.A., Inc.
5583 S. Western Avenue
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1828 L Street, N.W.
Washington, D.C. 10036

Federation of the Handicapped, Inc.
211 West 14th Street
New York, New York 10011

Fifty-Two Association of New York, Inc.
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New York, New York 10022

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Florida Avenue at 7th Street, N.E.
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Goodwill Industries of America, Inc.
9200 Wisconsin Avenue, N.W.
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Guide Dog Foundation for the Blind
109 - 19 - 72nd Avenue
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Handicapped Artists of America, Inc.
8 Sandy Lane
Salisbury, Massachusetts 01950

Handy-Cap Horizons, Inc.
3250 E. Loretta Drive
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Housing Committee for the Physically H
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57 Willoughby Street
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Information Center on Exceptional Children
The Council for Exceptional Children
1499 Jefferson Davis Highway, Suite 900
Arlington, Virginia 11101

Institute for Crippled and Disabled
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New York, New York 10030

International Association of Rehabilitation Facilities
Charles L. Roberts, Co-Executive Director
5530 Wisconsin Avenue, N.W., Suite 955
Washington, D.C. 20015

International Handicappers Net
Ray E. Meyers, Corresponding Secretary
Box "R"
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Joint Handicapped Council
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3501 Taylor Avenue
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810 Seventh Avenue
New York, New York 10019

National Amputation Foundation
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[illegible] for Visually Handicapped
3201 Balboa Street
San Francisco, California 94121

National Association of Sheltered Workshops
Homebound Programs, Inc.
1029 Vermont Avenue, N.W.
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National Association of Retarded Children
420 Lexington Avenue
New York, New York

National Association of the Deaf
814 Thayer Avenue
Silver Spring, Maryland 20910

National Association of the Physically Handicapp
Jack Howard, President
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National Center for Deaf-Blind Youths and Adu
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New Hyde Park, Long Island, New York 110

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National Children's Center, Inc.
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Minneapolis, Minnesota 55423

National Cystic Fibrosis Research Foundation
3379 Peachtree Road, N.E.
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Des Moines, Iowa 50309

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7315 Wisconsin Avenue, N.W., Suite 301-W
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134 Jackson Street, Apt. No. B
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President's Committee on Employment of the Handicapped

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Silver Spring, Maryland 20910

Project Volunteer Power
1028 Connecticut Avenue, N.W.
Washington, D.C. 20036

Rehabilitation International
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New York, New York 10010

Sertoma Foundation
Professional Office Building, Suite 401
800 Montclair Road
Birmingham, Alabama 35213

Sister Elizabeth Kenny Foundation
1800 Chicago Avenue
Minneapolis, Minnesota

Social and Rehabilitation Service
330 C Street, S.W.
Washington, D.C. 20201

Social Security Administration
6401 Security Boulevard
Baltimore, Maryland 21235

United Cerebral Palsy Associations, Inc
66 East 34th Street
New York, New York 10016

United States Wheelchair Sports Fund
40-24 - 62nd Street
Woodside, New York 11377

Veterans Administration
810 Vermont Avenue, N.W.
Washington, D.C. 20420

were visited, photographed or observed during the course of this study. Therefore, no authentication or substantiation as to the accessibility or the completeness of design or adaptation is given. Undoubtedly there are a great many other projects beyond these. However, this is a listing of those projects, areas or places which were either submitted to the staff or were otherwise called to our attention during the course of this study.

These particular projects are supplemented by those specific areas treated in greater detail in the case studies section.

- -

An Environmental Resource Center for the Handicapped
Lido Beach Town Park
Hempstead, Long Island, New York

Bald Eagle Playground Development
Nichols Avenue and Joliet Street, S.W.
Washington, D.C.

Benning Stoddert Community Center
155 Ridge Road, S.E.
Washington, D.C.

Bird S. Coler Hospital
(Playground for the Physically Handicapped, designed by Richard Cattner)
Welfare Island, New York

Braille Trail
Elephant Rocks State Park
Missouri

Braille Trail
Stapleton Park
City of Denver, Colorado

Brockdale Park
Lavon Reservoir
Dallas, Texas

Broken Bowl Picnic Ground
Willamette National Forest
Forest Supervisor
210 E. 13th Street
Eugene, Oregon 97401

Wisconsin Dells
Wisconsin

Cape Perpetua Visitor Center
Siuslaw National Forest
Forest Supervisor
545 South Second Street
Corvallis, Oregon 57330

Catalina Desert Nature Trail
Coronado National Forest
130 South Scott - P.O. Box 551
Tucson, Arizona 85702

Childrens Development Center
Recreational Play Space
Dallas, Texas

Center Park Apartments
825 Yesler Way
Seattle, Washington 98104

Cienega Nature Trail
Cibola National Forest
U.S. Courthouse Building, Room 510
421 Gold Avenue, P.O. Box 1826
Albuquerque, New Mexico 87103

Creative Living
445 W. 8th Avenue
Columbus, Ohio 44112

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3864 Middlefield Road
Palo Alto, California

Day Use Area for the Handicapped
Angeles National Forest
150 South Los Robles
Pasadena, California 91101

Discovery Way Nature Trail
George Washington National Forest
Forest Supervisor
Federal Building
Harrisonburg, Virginia 22801

Dr. Edmund A. Babler Memorial State Handicapped
Missouri State Park Board
St. Louis County, Missori

East Central Sate College
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go, California 92103

ted Way Nature Trail
National Forest
Supervisor
Building, P.O. Box 840
ordo, New Mexico 88310

Pier
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Supervisor
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ff, Arizona 86002

Pier
ational Forest
Supervisor
First South
Utah 84601

International University
Florida

rgo State Park
Georgia

Blend Elementary School for the Blind
geles, California

s By the Sea (for the Blind)
W. Baker, Curator
al Gardens
, Virginia

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ncisco, California

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Park
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Training Area
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eteran Avenue
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Cleyburn, Texas

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Sapphire Overlook
Arapaho National Forest
Forest Supervisor
P.O. Box 692
Golden, Colorado 80401

Illinois Visually Handicapped Institute
Chicago, Illinois

Independence Hall
Airline Drive at Burress Street
Houston, Texas

Jacob L. Babler Group Camp for the Handicapped
Missouri State Parks
St. Louis County, Missouri

Jessie Stanton Development
Playground for Handicapped Children
New York, New York

Kenilworth Parkside
40th and Anacostia Avenue, N.E.
Washington, D.C.

Kentucky Society for Crippled Children Camp
Carrollton, Kentucky

Lake Barkley State Park
Kentucky

Land of the Lakes Nature Trail
Grand Mesa National Forest
Forest Supervisor
11th and Main Streets
Delta, Colorado 81486

Langdon Park Recreation Center
20th and Franklin Streets, N.E.
Washington, D.C.

Lavaland Visitor Center
Deschutes National Forest
Forest Supervisor
211 East Revere Avenue
Bend, Oregon 97701

Carbondale, Illinois 62901

Malcolm Bliss Mental Health Center
Playground for Emotionally Disturbed Children
St. Louis, Missouri

Mammoth Lake Campground
Inyo National Forest
William J. Murphy, District Ranger
P.O. Box 146
Mammoth Lakes, California

New Horizons
2525 North Broadway
Fargo, North Dakota 58102

Parent Park
Denton State School
Denton, Texas

Park and Recreation Area
Rock-A-Way, Missouri

Park View Recreation Center
Warder Street and Princeton Place, N.W.
Washington, D.C.

Pilgrim Tower
Pilgrim Lutheran Church of the Deaf
1233 South Vermont Avenue
Los Angeles, California 90006

Pine Alto Nature Trail
Los Padres National Forest
District Ranger
131 West Carment Lane
Santa Maria, California 93454

Play Area for the Handicapped
Hans Thompson Seattle Park Superintendent
Seattle, Washington

Recreation Center for the Handicapped
Brush Ford Park
Department of Parks and Recreation
Detroit, Michigan

Recreation Center for the Mentally and Physically Handicapped
Dissant Place Extended and G Street, S.E.
Washington, D.C.

Roaring Fork Braille Trail
White River National Forest

Federal Building, P.O. Box 1689
Santa Fe, New Mexico 97501

San Antonio Forest Camp
Santa Fe National Forest
P.O. Box 1689
Santa Fe, New Mexico 87501

Scented Garden for the Blind
Missouri Botanical Garden
St. Louis, Missouri

Sensory Garden
Nassau County Department of Public W
Wantach, Long Island, New York

Somerville Trailway
Lake Somerville State Park
Somerville, Texas

Special Care School
Recreational Play Space
Dallas, Texas

State Recreation Park for the Hand
posed)
Utah State Training School
Provo, Utah

Stockton Lake and Reservoir
Stockton, Missouri

Tebble Fork Recreation Area
Unita National Forest
Utah

Tenderfoot Path, Trail
Wilderness Wildcat Nature Center
Dominican Education Center
Sinsinawa, Wisconsin

The Singing and Fragrance Walk fo
Roy & Margot Larsen Sanctuary
Bridgeport Garden Club
Audubon Society of Connecticut
Southern, Connecticut

The South Park Trail
South Park Allegheny County
Pennsylvania

Three Senses Nature Trail for the Blind
Fountains Paint Pot Scenic Drive
Lower Geyser Basin

Petersburg National Battlefield
Petersburg, Virginia

Trail for the Handicapped
Rock Creek Nature Center
Washington, D.C.

Trout Pond
Appalachicola National Forest
P. O. Box 65
Crawfordville, Florida 32327

United Cerebral Palsy Center
Recreational Play Space
Dallas, Texas

University of Missouri
Columbus, Missouri

University of New Mexico
Albuquerque, New Mexico

Vistola Manor
400 Nebraska Avenue
Toledo, Ohio 43602

Walt Disney World
Orlando, Florida

Walter R. Roberts Manor
1024 South 32nd Street
Omaha, Nebraska 68105

Whispering Pines Nature Trail
San Bernardino National Forest
Forest Supervisor
144 N. Mountain View Avenue
San Bernardino, California 91405

Whispering Woods Trail
Bendix Woods County Park
South Bend, Indiana

number of terms describing specific handicaps
ere presented in the chapter on "The Handicapped
opulation." *The following is an alphabetic listing*
those terms, and other terms relating to the de-
gn of facilities for the handicapped:

ACTIVITY HANDICAP: This generally refers to
y sort of handicap, not otherwise indicated, which
ould curtail the activities of a person. This is gene-
lly an ailment of the heart or respiratory system, or
y of various forms of arthritis and rheumatism.
e term does not include visual or audial handicaps,
r those specifically related to mobility. Generally,
rsons with an activity handicap of any type cannot
ay strenuous games or engage in certain other forms
physical activity. It is difficult, in designing, to
ake specific provisions for persons with activity
ndicaps - this is largely a programmatic problem.
owever, it should be recognized that a large number
persons in the United States have activity handi-
ps, but no other indicated forms of handicaps.

AGING: Those manifestations of the aging pro-
sses that significantly reduce mobility, flexibility,
ordination, and perceptiveness but are not ac-
unted for in other categories.

THE AMBULANT DISABLED: Ambulant dis-
ed people are those who are able, either with or
thout personal assistance, to walk on the level and
gotiate suitable graded steps provided that conve-
nt handrails are available.

ARTIFICIAL LIMBS: An artificial limb is a de-
e to replace a missing leg, arm, hand, or foot. It
es not have to have moving parts, but a device em-
oyed only for lengthening a leg where the whole
or foot, if present, is not counted.

AUDIAL - PARTIAL: This includes persons with
paired hearing, but still able to hear major sounds,
ses or other audial warnings from the exterior en-
onment. These persons are handicapped to a cer-
n extent in their use of exterior site facilities;
wever, they are probably the least handicapped in
s way, though they are more handicapped in terms
communications with people in general.

AUDIAL - TOTAL: A person with this handicap
no ability to hear any sounds at all. This may be
genital or may be the result of disease. It may
me through steady deterioration which culminates

provide some support at hand level in walk

CAUTION STRIPS: Caution strips are a ser
strips which have a different textured surface
warns a visually impaired person of an approac
area which should be traveled cautiously.

COMMON LEVEL CROSSINGS: Common
crossings are where a lower leveled surface rises
meet a higher leveled surface which is sloping c
to common median point.

CROSS-OVERS: Cross-overs are short conr
ing surfaces which span the gutter portion of
street.

CURB-CUTS: Curb-cuts are openings, break
removed portions of a curb.

CRUTCHES: A crutch is a staff with a crossp
at the top to support the person in walking.
point of support may be the axilla, upper arm
forearm. For each crutch a second support is at h
level.

DANGER SURFACING: Danger surfacing
different textured surface that warns a visually
paired person of an approaching area which is p
lous and should not be entered.

THE DISABLED: The disabled are those peo
who, as a consequence of physical disability or
pairment, may be restricted or inconvenienced
their use of buildings because of:

(1) The presence of physical barriers, such
steps, or doors which are too narrow for whe
chairs.

(2) The lack of suitable facilities such as stairc
handrails or grip rails beside water close

DISABILITIES OF AGING: Those manifes
tions of the aging processes that significantly redu
mobility, dexterity, flexibility, coordination, and p
ceptiveness but are not accounted for in the afo
mentioned categories.

DISABILITIES OF INCOORDINATION: Fau
coordination or palsy from brain, spinal, or periph
al nerve injury.

FIXED TURNING RADIUS, FRONT STRU
TURE TO REAR STRUCTURE: The turning rad

HEARING DISABILITIES: Deafness or hearing
andicaps that might make an individual insecure in
ublic areas because he is unable to communicate or
ear warning signals.

INVOLVED (INVOLVEMENT): A portion or
ortions of the human anatomy or physiology, or
oth, that have a loss or impairment of normal funo·
on as a result of genesis, trauma, disease, inflamma-
on or degeneration.

ISLANDS: Islands are raised levels amidst vehicu-
ar thoroughfares for the rest and safety of pedestri-
ns.

LOCOMOTORY DISABILITIES: People with lo-
omotory disabilities are those with disabilities which
ffect mobility, i.e. impairment of the trunk, lower
mbs, or the trunk and lower limbs.

MANUAL HANDICAP: A manual handicap
rgely has to do with the loss of hands or fingers or
eir use. It is associated with arthritis, rheumatism
r other malformations or disabilities of the hands or
f arms or with amputation.

Many disabled people with impaired lower limbs
so have impaired upper limbs. To satisfy the re-
uirements of such people account shall be taken si-
ultaneously of the limitations imposed by both up-
er and lower limb impairment.

PARTIAL: A partial manual handicap would en-
il the impairment of either both hands to a certain
egree or one hand with total disability. It may
ean the lack of a replacement of a missing hand or
m with a mechanical device used in the place of the
issing appendage. A partial manual disability means
e person has some use of hands or arms and some
anual dexterity.

TOTAL: A total manual handicap means that the
erson has no use of his hands or arms. Therefore, he
handicapped in those aspects in the use of the ex-
emities. It may be the result of arthritis, rheuma-
sm, amputation not replaced by artificial limbs, or
aralysis from back and spine injuries.

MECHANICAL AID: Any special aid device used
compensate for effects resulting from disease, in-
ry, impairment, or congenital malformation. Aids
cluded in this survey are artificial limbs, braces,

one who from childhood experiences unusual d
culties in learning and is relatively ineffective in
plying whatever he has learned to the problems of
dinary living. Degrees of mental retardation are n
sured by considering both measured intelligence
impairment in adaptive behavior. The American
sociation for Mentally Retarded Children sugg
that: 'For descriptive convenience, the range of n
tal retardation is divided into four levels - m
moderate, severe and profound.' "

MOBILITY HANDICAP: A mobility handi
curtails the ability to move or ambulate. It may
caused by partial or total paralysis, or by the abse
of extremities which have not been replaced by
chanical aids, or by arthritis, rheumatism, clubfo
injuries to the back or spine, or other disabilities
deformations.

SENSORY DISABILITIES: People with sens
disabilities are those who, as a consequence of bli
ness, deafness, impaired sight or impaired hear
may be restricted or inconvenienced in their use
buildings because of the lack of suitable facilit
The categories 'sensory disabilities' and 'locomot
and manipulatory disabilities' are not mutually
clusive. Many disabled people, particularly am
the elderly, are included in both categories.

SIGHT DISABILITIES: Total blindness or i
pairments affecting sight to the extent that the
dividual functioning in public areas is insecure or
posed to danger.

SPECIAL SHOES: Special shoes are shoes of s
cial construction or design which are used to help
person in getting around, compensating for an inju
condition or malformation. Oversized shoes of n
mal or unusual construction are excluded.

STEPS: Steps are a series of risers connecti
one level to another outside of a building complex
leading up to a building entrance.

STAIRS: Stairs are a series of risers connect
one level to another within a building compl

VISUAL HANDICAPS: Visual Handicaps
graded according to severity, which may be judgec
the following standards:

25% impairment - inability to focus. Subj
tively, it is the inability to recognize a friend on

must always use a cane, or occasionally a seeing-eye dog, and the same provision should be made for them as for the totally blind.

100% impairment - total lack of vision in both eyes. These persons, unable to recognize any form, color, or light, must almost always use a cane or seeing-eye dog, or be guided in some other way.

WALK, WALKS: Because the terms "walk" or "walks" have a multitude of meanings and uses, their use in this text is clearly defined as predetermined, prepared-surface, exterior pathway leading to or from a building or facility, or from one exterior area to another, placed on the existing ground level and not deviating from the level of the existing ground immediately adjacent.

WALKER: A walker is a four-legged stand which provides support for the person. It is moved by lifting or by wheeling on casters.

WHEELCHAIR: A wheelchair is a chair on wheels, intended to be propelled by the occupant by means of handrims attached to the two large wheels, or, at times, pushed by an attendant.

THE WHEELCHAIR BOUND: The wheelchair bound are those people who are unable to walk either with or without assistance, and who, except when using mechanized transport, depend on a wheelchair for mobility.

While being unable to walk, a minority of people in this group are not strictly chairbound, inasmuch as they are able to stand on their feet whilst transferring to and from a wheelchair.